June 2005

XT IEC Power Control

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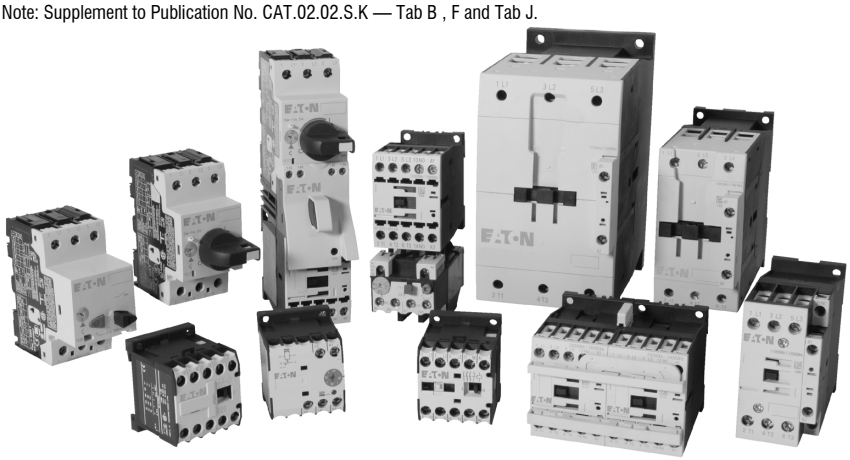
Note: Supplement to Publication No. CAT.02.02.S.K — Tab B , F and Tab J.



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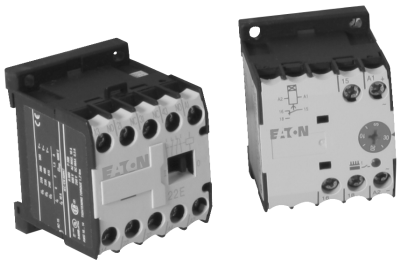


Product Description

Eaton's new line of XT Relays and Timers includes mini and standard frame control relays and auxiliary contacts, mini electronic on-delay and multi-function timers and an electronic star-delta (wye-delta) timer for use in star-delta (wye-delta combinations. Because XT meets UL, CSA, CCC and CE standards, it is the perfect product solution for IEC applications all over the world. The compact, space saving, and easy to install XT line of IEC contactors and starters is the efficient and effective solution for customer applications.

Features

- For use with Mini and Standard frame size contactors and starters
- Control Relays
  - AC Control from 12V to 550V 50 Hz, 600V 60 Hz
  - DC Control from 12V to 220V
- On-Delay and Multi-FunctionTimers
  - 24 – 240V AC/DC Control
- Available with screw or spring cage terminals
- 4-Pole Configurations
- IP20 finger and back-of-hand proof
- Large ambient temperature range – 25° to 50°C [-13° to 122°F]

Standards and Certifications

- IEC EN 60947
- CE Approved
- UL
- CSA
- CCC (pending)
- ATEX (pending)

Instructional Leaflets

Pub51219	Inside of Packaging XTRM Mini Control Relays
Pub51210	Inside of Packaging 7-15A XTCE Contactors and XTRE Control Relays
Pub51244	XTTR Electronic Star-Delta (Wye-Delta) Timer
Pub51245	XTMT Mini Electronic On-Delay and Multi-Function Timers

Catalog Number Selection

Table 1. XT — Relay Catalog Numbering System

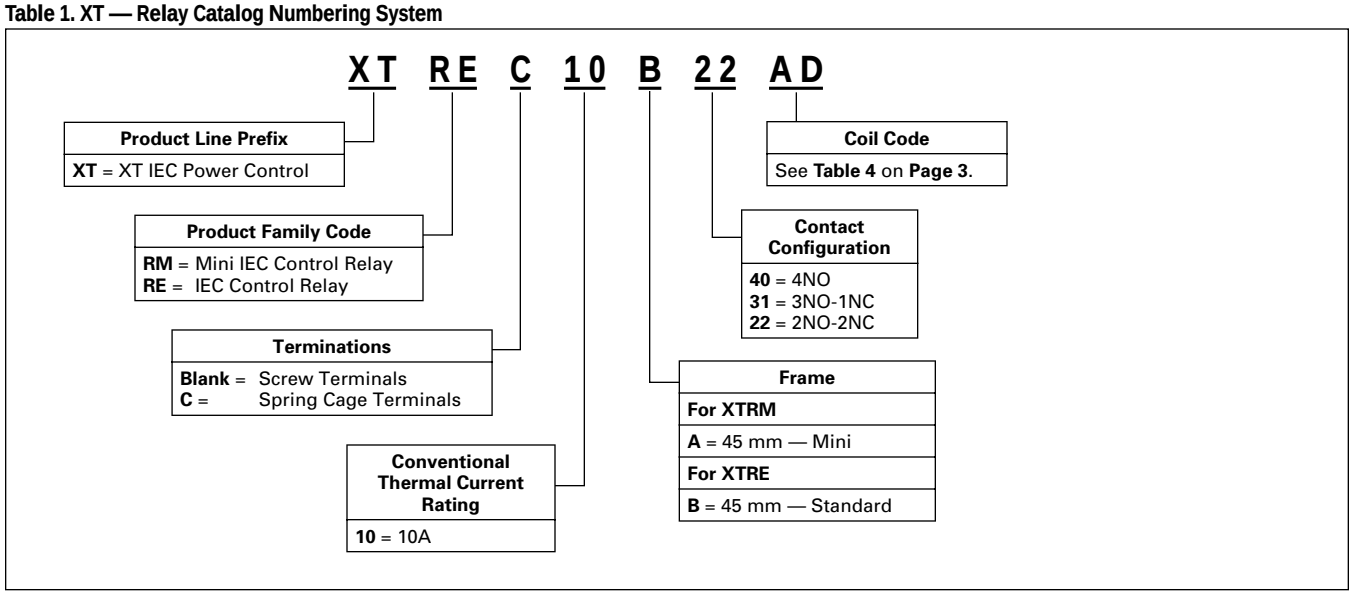
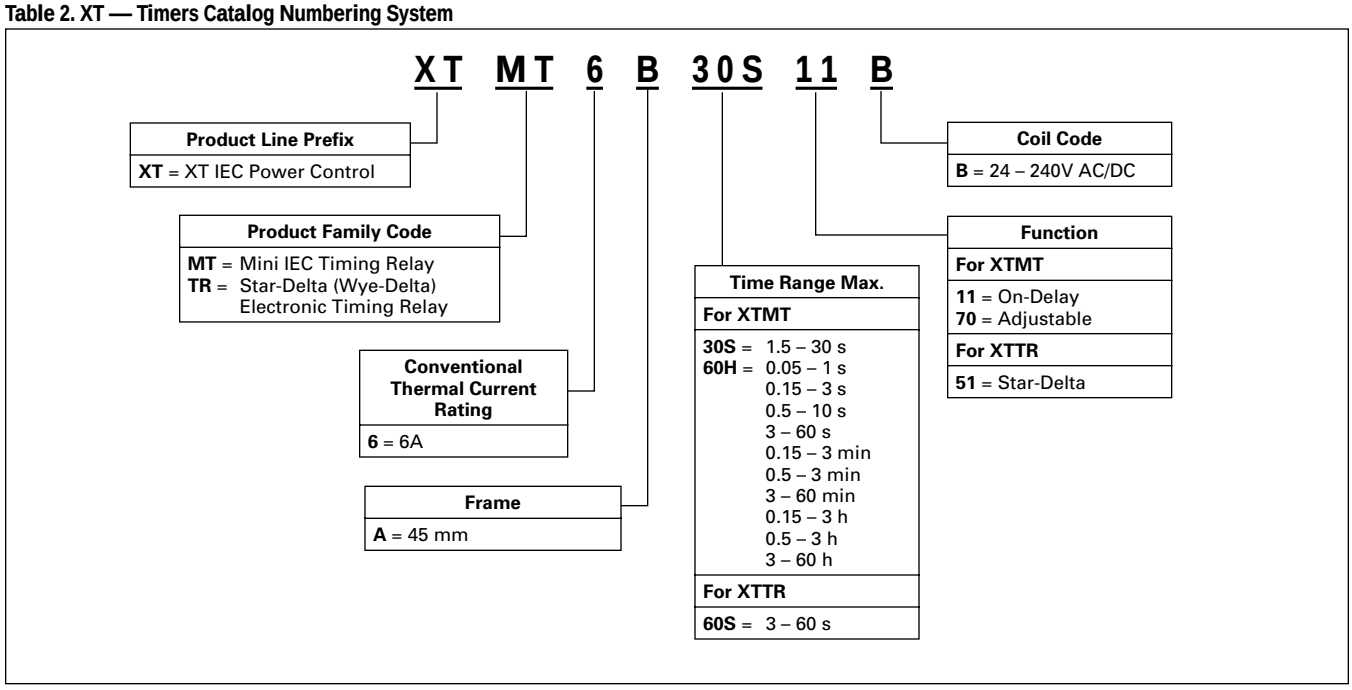
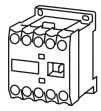


Table 2. XT — Timers Catalog Numbering System

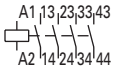
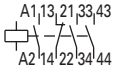
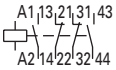


Product Selection



Mini Control Relays

Table 3. Mini Control Relays

Conventional Thermal Current I_{th} (A)	Contact Configuration	Rated Operational Current I_e AC-15 Amps		Circuit Symbol	Screw Terminals Catalog Number ①	Spring Cage Terminals Catalog Number ①	Price	
		220/230/240V	380/400/415V				AC Coil	DC Coil
10	4NO	6	3		**XTRM10A40_**	**XTRMC10A40_**		
10	3NO-1NC	6	3		**XTRM10A31_**	**XTRMC10A31_**		
10	2NO-2NC	6	3		**XTRM10A22_**	**XTRMC10A22_**		

① Underscore (_) indicates magnet coil suffix required. See **Table 4**.

Table 4. Coil Voltage Suffix

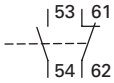
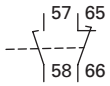
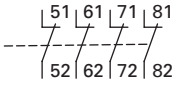
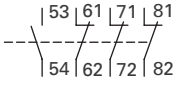
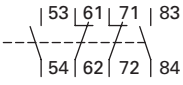
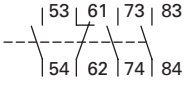
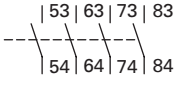
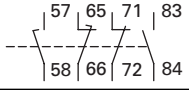
Coil Voltage	Suffix Code
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD** ②
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**

Coil Voltage	Suffix Code
208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**
380V 60 Hz	**P**
12V 50/60 Hz	**R**

Coil Voltage	Suffix Code
24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**
120V DC	**AD** ②
220V DC	**BD** ②
12V DC	**RD** ②
48V DC	**WD** ②

② With DC Operation: Integrated diode-resistor combination, coil consumption 2.6 kW.

Table 5. Front Mount Auxiliary Contacts for use with XTRM Mini Control Relays

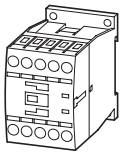
Conventional free air thermal current, $I_{th} = I_e$, AC-1 in Amps	Contact Configuration	Contact Sequence	Package Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number	Price ①
10	0NO-2NC		5	**XTMCXFA02**	**—**	
10	1NO-1NC		5	**XTMCXFA11**	**XTMCXFAC11**	
10	2NO-0NC		5	**XTMCXFA20**	**—**	
10	1NO-1NC		5	**XTMCXFAL11** ②	**—**	
10	0NO-4NC		5	**XTMCXFA04**	**XTMCXFAC04**	
10	1NO-3NC		5	**XTMCXFA13**	**XTMCXFAC13**	
10	2NO-2NC		5	**XTMCXFA22**	**XTMXCFAC22**	
10	3NO-1NC		5	**XTMCXFA31**	**XTMCXFAC31**	
10	4NO-0NC		5	**XTMCXFA40**	**XTMCXFAC40**	
10	2NO-2NC		5	**XTMCXFAL22** ②	**XTMCXFCLC22** ②	

① Price listed is for a quantity of (1), orders must be placed in multiples of the package quantity listed.

② 1 early-make contact, 1 late-break contact.

Discount Symbol **MC8**

Control Relays



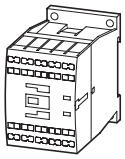
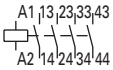
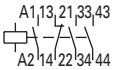
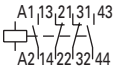


Table 6. Control Relays

Conventional Thermal Current I_{th} (A)	Contact Configuration	Rated Operational Current I_e AC-15 Amps		Circuit Symbol	Screw Terminals Catalog Number ①	Spring Cage Terminals Catalog Number ①	Price ②	
		220/230/240V	380/400/415V				AC Coil	DC Coil
10	4NO	6	4		**XTRE10B40_**	**XTREC10B40_**		
10	3NO-1NC	6	4		**XTRE10B31_**	**XTREC10B31_**		
10	2NO-2NC	6	4		**XTRE10B22_**	**XTREC10B22_**		

① Underscore (_) indicates magnet coil suffix required. See **Table 7**.

② Price listed is for a quantity of (1), orders must be placed in multiples of the package quantity listed.

Table 7. Coil Voltage Suffix

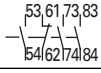
Coil Voltage	Suffix Code
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD** ③
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**

Coil Voltage	Suffix Code
208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**
380V 60 Hz	**P**
12V 50/60 Hz	**R**

Coil Voltage	Suffix Code
24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**
120V DC	**AD** ③
220V DC	**BD** ③
12V DC	**RD** ③
48V DC	**WD** ③

③ With DC Operation: Integrated diode-resistor combination, coil consumption 2.6 kW.

Table 8. Front Mount Auxiliary Contacts for Use with XTRE Control Relays

	Conventional Free Air Thermal Current, $I_{th} = I_e$, AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number	Price ①
	10	2	2NO		5	**XTCEXFAC20**	**XTCEXFACC20**	
	10	2	1NO-1NC		5	**XTCEXFAC11**	**XTCEXFACC11**	
	10	2	2NC		5	**XTCEXFAC02**	**XTCEXFACC02**	
	10	2	1NO-1NC		5	**XTCEXFALC11** ②	**XTCEXFALCC11** ②	
	10	4	4NO		5	**XTCEXFAC40**	**XTCEXFACC40**	
	10	4	3NO-1NC		5	**XTCEXFAC31**	**XTCEXFACC31**	
	10	4	2NO-2NC		5	**XTCEXFAC22**	**XTCEXFACC22**	
	10	4	1NO-3NC		5	**XTCEXFAC13**	**XTCEXFACC13**	
	10	4	4NC		5	**XTCEXFAC04**	**XTCEXFACC04**	
	10	4	2NO-2NC		5	**XTCEXFCLC22** ②	**XTCEXFCLCC22** ②	

① Price listed is for a quantity of (1), orders must be placed in multiples of the package quantity listed.

② 1 early-make contact, 1 late-break contact.

Discount Symbol **MC8**

Mini Electronic On-Delay Timers

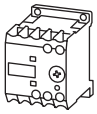
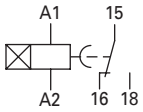


Table 9. Mini Electronic On-Delay Timers

Conventional Thermal Current I_e (A)	Rated Operational Current I_e AC-11 Amps		Time Range	Function	Terminal Marking According to EN 50042	Catalog Number	Price
	220/230/240V	380/400/440V					
6	3	3	1.5 – 30 sec .05 – 1 sec 0.15 – 3 sec 0.5 – 10 sec 3 – 60 sec	Fixed, On-delay		**XTMT6A30S11B**	
6	3	6	0.15 – 3 min 0.5 – 10 min 3 – 60 min 0.15 – 3 h 0.5 – 10 h 3 – 60 h	Fixed, On-delay		**XTMT6A60H11B**	

Mini Electronic Multi-Function Timers with Connection for Remote Potentiometer

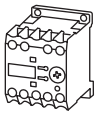
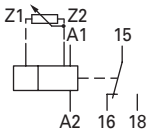


Table 10. Mini Electronic Multi-Function Timers with Connection for Remote Potentiometer

Conventional Thermal Current I_e (A)	Rated Operational Current I_e AC-11 Amps		Time Range	Function	Terminal Marking According to EN 50042	Catalog Number	Price
	220/230/240V	380/400/440V					
6	3	3	.05 – 1 sec 0.15 – 3 sec 0.5 – 10 sec 3 – 60 sec 0.15 – 3 min 0.5 – 10 min 3 – 60 min 0.15 – 3 h 0.5 – 10 h 3 – 60 h	Adjustable: On-delayed; Fleeting contact on energization; Flashing; Pulse generating; ON-OFF		**XTMT6A60H70B**	

Notes —

Actuating Voltage
24 – 240 50/60 Hz
24 – 240V DC

Admissible Cable Length	Connection to
Cable unscreened, with cable cross-section 0.5 – 1.5 mm^2	Y1/Y2, Z1/Z2
Two-core cable	M250
Two-core cable in the same cable duct with the main cable, 50/60 Hz	M50

Electronic Star-Delta (Wye-Delta)

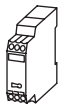
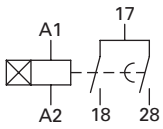


Table 11. Electronic Star-Delta (Wye-Delta)

Conventional Thermal Current I_e (A)	Rated Operational Current I_e AC-11 Amps		Time Range	Function	Terminal Marking According to EN 50042	Catalog Number	Price
	230V	400V					
6	3	3	3 – 60 sec	Fixed, Star-Delta		**XTTR6A60S51B**	

Notes —

Actuating Voltage
24 – 240 50/60 Hz
24 – 240V DC

Admissible Cable Length	Connection to
Cable unscreened, with cable cross-section 0.5 – 1.5 mm^2	B1, Z1/Z2
Two-core cable	M250
Two-core cable in the same cable duct with the main cable, 50/60 Hz	M50

Discount Symbol **MC8**

Technical Data and Specifications

Table 12. Relays and Timers — Technical Data and Specifications

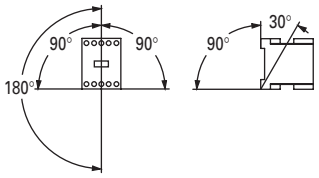
Description	XTRE	XTCEXFAC_	XTRM	XTMCXFA_
General				
Standards	IEC/EN 60947, VDE 0660, UL, CSA			
Lifespan, Mechanical AC Operated DC Operated	 20,000,000 20,000,000	 10,000,000 10,000,000	 10,000,000 20,000,000	 10,000,000 20,000,000
Maximum operating frequency (ops/hr)	9000	9000	9000	9000
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclical, to IEC 60068-2-30			
Ambient Temperature Open (°C) Enclosed (°C) Ambient Temperature for Storage (°C)	 -25/60 -25/40 -40/80	 -25/60 -25/40 -40/80	 -25/50 -25/40 —	 -25/50 -25/40 —
Mounting Position			As required, except vertically A1/A2 at the bottom	
Mechanical shock resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 ms Base unit with auxiliary contact module Make contact Break contact Half-sinusoidal shock 20 ms Base unit with auxiliary contact module Make contact Break contact	 7g 5g — —	 — — — —	 10g 8g — —	 10g 8g — —
Degree of Protection	IP20	IP20	IP20	IP20
Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)	Finger- and back-of-hand proof			
Weight AC operated (kg) DC operated (kg)	 0.23 0.28	 0.23 0.28	 0.17 0.20	 — —
Terminal capacity Screw terminals Solid (mm^2) Flexible with ferrule (mm^2) Solid or stranded (AWG)	 1 x (0.75 – 4) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 18 – 14		 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 1.5) 2 x (0.75 – 1.5) 18 – 14	
Terminal screw	M3.5	M3.5	M3.5	M3.5
Pozidriv screwdriver	Size 2	Size 2	Size 2	Size 2
Standard screwdriver (mm)	0.8 x 5.5 1 x 6		0.8 x 5.5 1 x 6	
Max. tightening torque (Nm)	1.2	1.2	1.2	1.2
Spring cage terminals Solid (mm^2) Flexible with or without ferrule DIN 46228 (mm^2) Solid or stranded (AWG)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 18 – 14		 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 18 – 14	
Standard screwdriver (mm)	0.6 x 3.5			
Contacts				
Interlocked opposing contacts to ZH 1/457, including auxiliary contact module	—	—	Yes	Yes
Rated impulse withstand voltage (U_{imp}) V AC	6000	6000	6000	6000
Overvoltage category/pollution degree	III/3	III/3	III/3	III/3
Rated insulation voltage (U_i) V AC	690	690	690	690
Rated operational voltage (U_e) V AC	690	500	600	600
Safe isolation to VDE 0106 Part 101 and Part 101/A1 Between coil and auxiliary contacts (V AC) Between the auxiliary contacts (V AC)	 400 400	 400 400	 300 300	 300 300
Rated operational current AC-15 220/240V I_e 380/415V Ie 500V I_e	 6 4 1.5	 6 3 —	 6 3 1.5	 4 2 1.5

Table 12. Relays and Timers — Technical Data and Specifications (Continued)

Description	XTRE	XTCEXFAC_	XTRM	XTMCXFA_
Contacts (Continued)				
DC-13 ① DC-13 L/R ≤ 15 mS				
Contacts in series:				
1:24V	2.5	—	2.5	2.5
1:60V	1	—	—	—
2:60V	3	—	2.5	2.5
1:110V	0.5	—	—	—
3:110V	3	—	1.5	1.5
1:220V	0.25	—	—	—
3:220V	1	—	0.5	0.5
DC-13 L/R ≤ 50 mS				
Contacts in series:				
2:24V	—	—	—	—
3:24V	4	—	—	—
2:60V	—	—	—	—
3:60V	4	—	—	—
1:110V	—	—	—	—
3:110V	2	—	—	—
1:220V	—	—	—	—
3:220V	1	—	—	—
Contact reliability Fault probability (λ) (at U_e = 24V DC, U_{min} = 17, I_{min} = 5.4 mA)	$<10^{-8}$, < one failure in 10 million operations center			
Conventional thermal current (I_{th})	10	10	10	10
Short-circuit rating without welding				
Maximum overcurrent protective device				
220/240V – XTPR Frame B	4	—	4	4
380/415V – XTPR Frame B	4	—	4	4
Short-circuit protection, max. fuse ②				
500V (a gG/gL)	10	10	6	6
500V (A fast)	—	—	10	10
Current heat losses at load of I_{th}				
AC operated (W)	0.3	0.3	0.2	0.2
DC operated (W)	0.3	0.3	0.3	0.3
Magnet Systems				
Pick-up and drop-out values				
AC operated				
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz (Pick-up x U_c)	0.8 – 1.1	—	0.8 – 1.1	—
Dual-frequency coil 50/60 Hz (Pick-up x U_c)	0.8 – 1.1	—	0.85 – 1.1	—
DC operated ③				
Pick -up voltage (Pick-up x U_c)	0.8 – 1.1	—	0.85 – 1.3	—
At 24V: without auxiliary contact module (40°C) (Pick-up x U_c)	0.7 – 1.3	—	0.7 – 1.3	—
Power consumption				
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz				
Pick-up VA	24	—	25	—
Pick-up W	19	—	22	—
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz				
Sealing VA	4	—	4.6	—
Sealing W	1.2	—	1.3	—
Dual-frequency coil 50/60 Hz at 50 Hz				
Pick-up VA	28	—	30	—
Pick-up W	22	—	26	—
Dual-frequency coil 50/60 Hz at 50 Hz				
Sealing VA	4.6	—	5.4	—
Sealing W	1.4	—	1.6	—
Dual-frequency coil 50/60 Hz at 60 Hz				
Pick-up VA	26	—	29	—
Pick-up W	21	—	24	—
Dual-frequency coil 50/60 Hz at 60 Hz				
Sealing VA	3.9	—	3.9	—
Sealing W	1.2	—	1.2	—
DC operated				
Pull-in = sealing (W)	3	—	2.6	—
Duty factor	100	—	100	—
Switching times at 100% U_c (approximate values)				
AC operated closing delay (mS)	≤ 20	—	14 – 21	—
AC operated make contact opening delay (mS)	≤15	—	8 – 18	—
AC operated with auxiliary contact module, max. closing delay (mS)	—	—	45	45
DC operated closing delay (mS)	≤35	—	26 – 35	—
DC operated make contact opening delay (mS)	≤15	—	15 – 25	—
DC operated with auxiliary contact module, max. closing delay (mS)	—	—	70	70

① Making and breaking conditions to DC13, time constant as stated.

② See transparent overlay "Fuses" for time/current characteristics (please enquire).

③ Smoothed DC or three-phase bridge rectifier

Flow Diagrams — Electronic Timers

XTMT Mini Timers

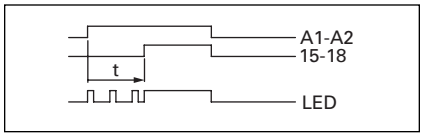


Figure 1. On-Delayed

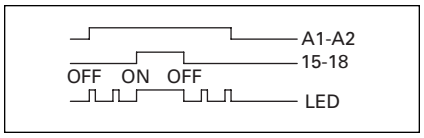


Figure 2. ON-OFF Function

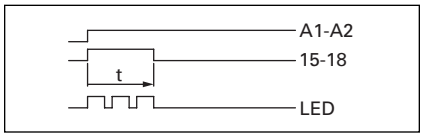


Figure 3. Fleeting Contact on Energization

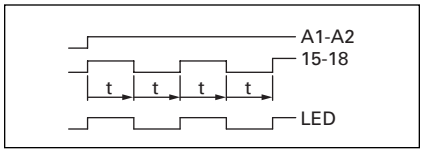


Figure 4. Flashing, Pulse Initiating

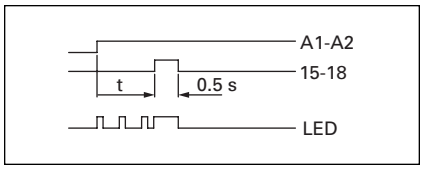


Figure 5. Pulse Generating

Star-Delta (Wye-Delta) Timer

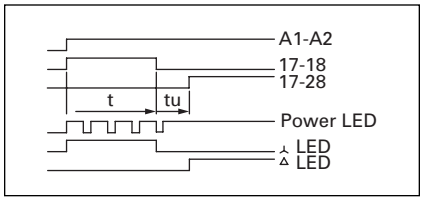


Figure 6. Star-Delta

Rating Data

Table 13. Rating Data for Approved Types

Pilot Duty	General Use
Control Relays — XTMR	
A600, P300	10A – 600V AC 0.5A – 250V DC
Timers — XTMT, XTTR	
B300	6A – 250V AC

Dimensions

Mini Contactor Relays

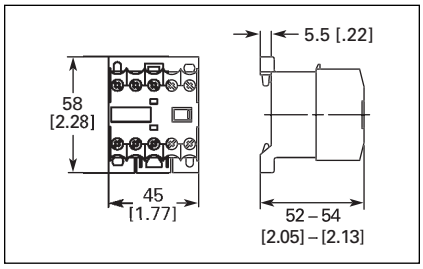


Figure 7. Mini Control Relay XTRM — Approximate Dimensions in mm [in.]

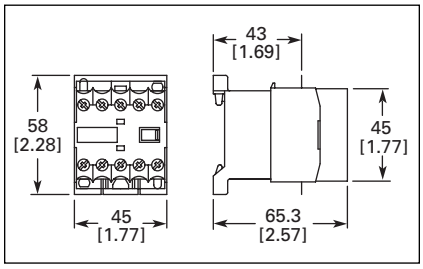


Figure 8. XTRM Mini Control Relay with IP40 XTMCX Shroud — Approximate Dimensions in mm [in.]

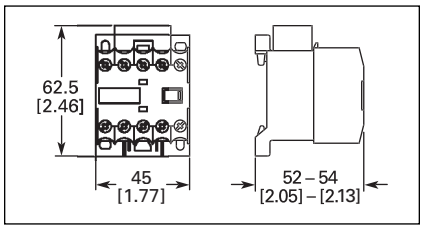


Figure 9. XTRM Mini Control Relay with RC or Varistor Suppressor — Approximate Dimensions in mm [in.]

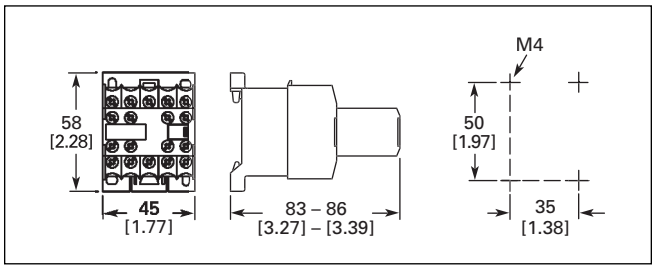


Figure 10. XTRM Mini Control Relay with XTMCXPA Auxiliary Control — Approximate Dimensions in mm [in.]

Contents

Description	*Page*
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Product Selection	**14**
Non-reversing Mini Contactors	**14**
Reversing Mini Contactors	**15**
Star-Delta (Wye-Delta) Miniature Contactors	**16**
Overload Relays	**17**
Accessories	**18**
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XTMC Mini Contactor

Product Description

Eaton's new line of Cutler-Hammer® XT Miniature Controls includes non-reversing and reversing mini contactors, mini overload relays and snap-on accessories. A wide range of applications is possible including small electrical motors from fractional to 5 hp (460V AC) or up to 4 kW (400V AC).

Application Description

Due to its compact size, the XT line of mini controls is best suited to be applied in light duty loads such as hoisting, packaging, material handling, heating, lighting and automation systems. XT mini contactors are a particularly compact, economic and environmentally friendly solution wherever control of small motors or loads is required.

Features

Mini Contactors — Types XTMC and XTMF, 6 – 9A

- AC Control from 12V to 550V 50 Hz, 600V 60 Hz
- DC Control from 12V to 220V
- Available with screw or spring cage terminals
- Reversing or Non-reversing
- 3 and 4-Pole Configurations
  - 3-Pole XTMC
  - 4-Pole XTMF
- Panel or DIN rail mounting
- IP20 finger and back-of-hand proof
- Low noise operation
- High degree of climatic proofing
- Large ambient temperature range -25° to 50°C [-13° to 122°F]

Mini Overload Relays — Bimetallic Type XTOM

- Phase failure sensitivity
- Direct mount to XTMC and XTMF Mini Contactors
- Trip Class 10
- 11 settings to cover 0.1 to 12A
- Ambient temperature compensated -5° to 50°C [23° to 122°F]
- Manual and automatic reset by selector switch
- 1 Make (NO) or 1 Break (NC) auxiliary contact as standard
- Test/Off Button
- Trip-free release

Standards and Certifications

- IEC EN 60947
- CE Approved
- UL
- CSA
- ATEX (pending)
- CCC (pending)

Instructional Leaflets

Pub51219	Inside of Packaging XTMC, XTMF Mini Contactors, XTRM Mini Control Relay and Accessories
Pub51243	Inside of Packaging XTOM Mini Overload Relays
Pub51206	Mini Reversing Link Kits
MN03402002E	XTOM Mini Overload Relays Installation and User Manual

Catalog Number Selection

Table 14. XT IEC Miniature Contactors — Catalog Numbering System

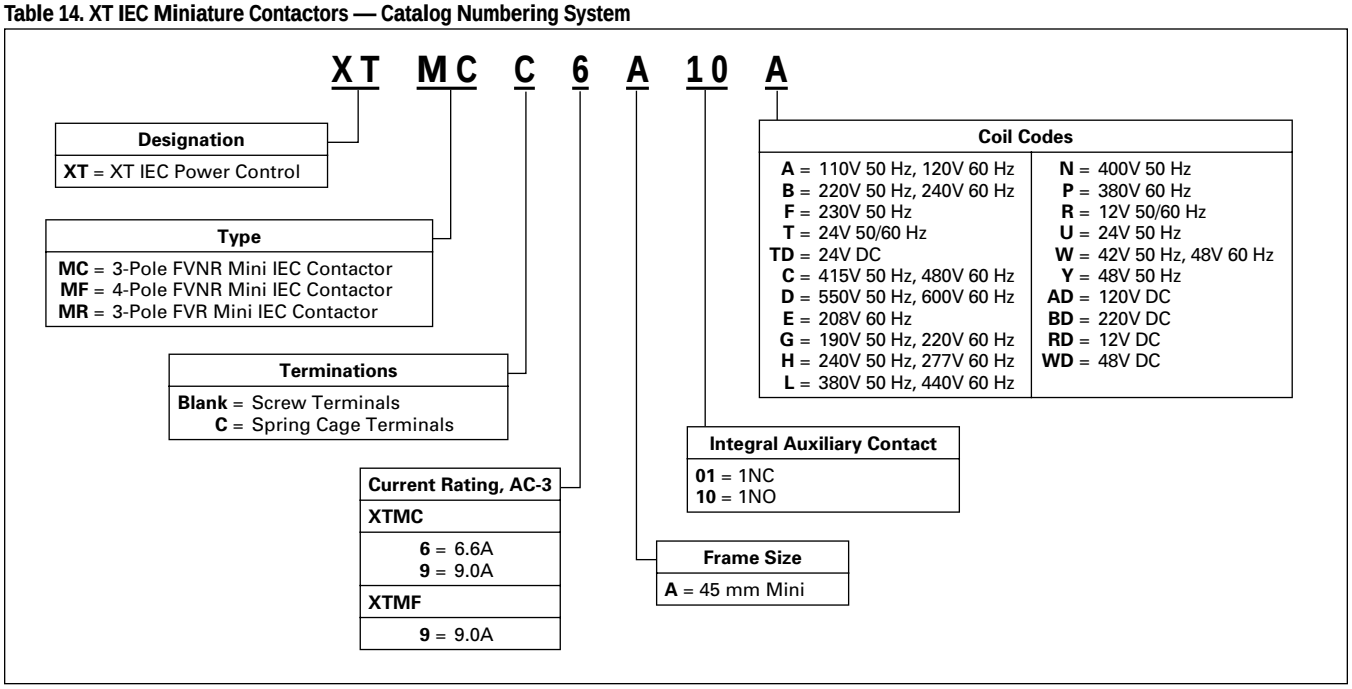
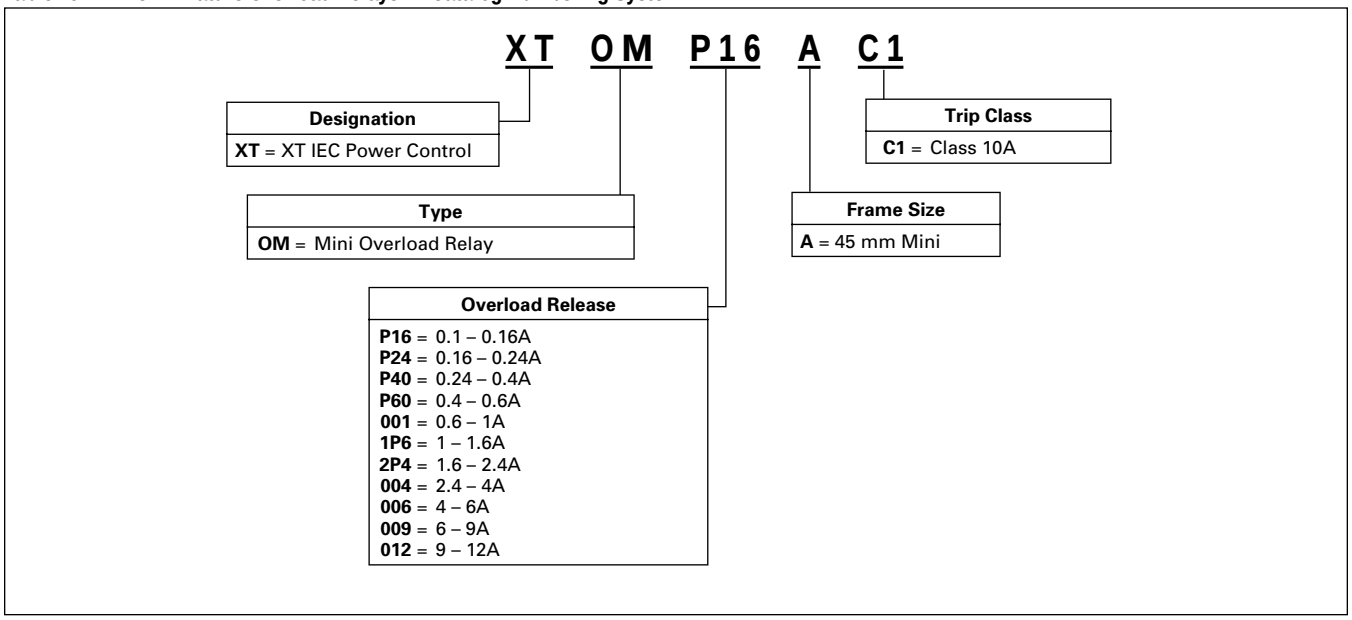

XT MC C 6 A 10 A
Designation
XT = XT IEC Power Control
Type
MC = 3-Pole FVNR Mini IEC Contactor
MF = 4-Pole FVNR Mini IEC Contactor
MR = 3-Pole FVR Mini IEC Contactor
Terminations
Blank = Screw Terminals
C = Spring Cage Terminals
Current Rating, AC-3
XTMC
6 = 6.6A
9 = 9.0A
XTMF
9 = 9.0A
Frame Size
A = 45 mm Mini
Integral Auxiliary Contact
01 = 1NC
10 = 1NO
Coil Codes
A = 110V 50 Hz, 120V 60 Hz
B = 220V 50 Hz, 240V 60 Hz
F = 230V 50 Hz
T = 24V 50/60 Hz
TD = 24V DC
C = 415V 50 Hz, 480V 60 Hz
D = 550V 50 Hz, 600V 60 Hz
E = 208V 60 Hz
G = 190V 50 Hz, 220V 60 Hz
H = 240V 50 Hz, 277V 60 Hz
L = 380V 50 Hz, 440V 60 Hz
N = 400V 50 Hz
P = 380V 60 Hz
R = 12V 50/60 Hz
U = 24V 50 Hz
W = 42V 50 Hz, 48V 60 Hz
Y = 48V 50 Hz
AD = 120V DC
BD = 220V DC
RD = 12V DC
WD = 48V DC

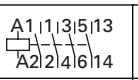
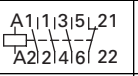
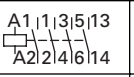
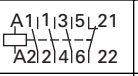
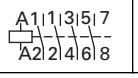
Table 15. XT IEC Miniature Overload Relays — Catalog Numbering System


XT OM P16 A C1
Designation
XT = XT IEC Power Control
Type
OM = Mini Overload Relay
Overload Release
P16 = 0.1 – 0.16A
P24 = 0.16 – 0.24A
P40 = 0.24 – 0.4A
P60 = 0.4 – 0.6A
001 = 0.6 – 1A
1P6 = 1 – 1.6A
2P4 = 1.6 – 2.4A
004 = 2.4 – 4A
006 = 4 – 6A
009 = 6 – 9A
012 = 9 – 12A
Frame Size
A = 45 mm Mini
Trip Class
C1 = Class 10A

Product Selection

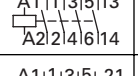
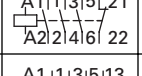
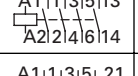
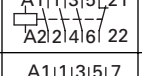
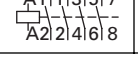
Non-reversing Mini Contactors

Table 16. Full Voltage Non-reversing Contactors with kW RATINGS

Operational Current AC-3 Amp Rating 380/400V	Conventional Free Air Thermal Current AC-1 at 50°C	Maximum kW Ratings AC-3 3-Phase Motors 50 – 60Hz				No. of Power Poles	Auxiliary Contacts	Circuit Symbol	Screw Terminals Catalog Number ①	Spring Cage Terminals Catalog Number ①	Price	
		220 – 240V	380 – 400V	550V	660/ 690V						AC Coil	DC Coil
6.6	20	1.5	3	3	3	3	1NO		**XTMC6A10_**	**XTMCC6A10_**		
6.6	20	1.5	3	3	3	3	1NC		**XTMC6A01_**	**XTMCC6A01_**		
8.8	20	2.2	4	4	4	3	1NO		**XTMC9A10_**	**XTMCC9A10_**		
8.8	20	2.2	4	4	4	3	1NC		**XTMC9A01_**	**XTMCC9A01_**		
8.8	20	2.2	4	4	4	4	—		**XTMF9A00_**	**—**		

① Underscore (_) indicates Magnetic Coil Suffix required. See **Table 18**.

Table 17. Full Voltage Non-reversing Contactors with HORSEPOWER RATINGS

Operational Current AC-3 Amp Rating 380/400V	Conventional Free Air Thermal Current AC-1 at 50°C	Maximum Three-phase Motor Rating 1-Phase Horsepower Ratings			3-Phase Horsepower Ratings				No. of Power Poles	Aux. Contacts	Circuit Symbol	Screw Terminals Catalog Number ②	Spring Cage Terminals Catalog Number ②	Price	
		115V	200V	230V	200V	230V	460V	575V						AC Coil	DC Coil
6.6	20	1/4	3/4	1	1-1/2	2	3	3	3	1NO		**XTMC6A10_**	**XTMCC6A10_**		
6.6	20	1/4	3/4	1	1-1/2	2	3	3	3	1NC		**XTMC6A01_**	**XTMCC6A01_**		
8.8	20	1/2	1	1-1/2	2	3	5	5	3	1NO		**XTMC9A10_**	**XTMCC9A10_**		
8.8	20	1/2	1	1-1/2	2	3	5	5	3	1NC		**XTMC9A01_**	**XTMCC9A01_**		
8.8	20	1/2	1	1-1/2	2	3	5	5	4	—		**XTMF9A00_**	**—**		

② Underscore (_) indicates Magnetic Coil Suffix required. See **Table 18**.

Table 18. Magnet Coil Suffix

Coil Voltage	Suffix Code	Coil Voltage	Suffix Code ③	Coil Voltage	Suffix Code ③	Coil Voltage	Suffix Code ③④
110V 50 Hz, 120V 60 Hz	**A**	415V 50 Hz, 480V 60 Hz	**C**	400V 50 Hz	**N**	120V DC	**AD**
220V 50 Hz, 240V 60 Hz	**B**	550V 50 Hz, 600V 60 Hz	**D**	380V 60 Hz	**P**	220V DC	**BD**
230V 50 Hz	**F**	208V 60 Hz	**E**	12V 50/60 Hz	**R**	12V DC	**RD**
24V 50/60 Hz	**T**	190V 50 Hz, 220V 60 Hz	**G**	24V 50 Hz	**U**	48V DC	**WD**
24V DC	**TD** ④	240V 50 Hz, 277V 60 Hz	**H**	42V 50 Hz, 48V 60 Hz	**W**	—	—
—	—	380V 50 Hz, 440V 60 Hz	**L**	48V 50 Hz	**Y**	—	—

③ For indicated coils, price adder of 10% must be applied to the contactor list price in **Tables 16** and **17**.
④ With DC Operation: Integrated diode resistor combination, coil rating 2.6W.

Overload Relays . . . . . **Page 17**
Accessories . . . . . **Page 18**
Dimensions . . . . . **Page 27**
Discount Symbol **MC8**

Reversing Mini Contactors

Table 19. Full Voltage Reversing Contactors with kW RATINGS

Operational Current AC-3 Amp Rating 380/400V	Conventional Free Air Thermal Current AC-1 at 50°C	Maximum kW Ratings AC-3				Spare Auxiliary Contacts		Catalog Number ①②	Price	
		3-Phase Motors 50 – 60 Hz				K1M	K2M			
		220/230/240V	380/400/440V	500V	660/690V	Forward Contactor	Reversing Contactor		AC	DC
6.6	20	1.5	3	3	3	33 / 34	33 / 34	XTMR6A21_		
8.8	20	2.2	4	4	4	33 / 34	33 / 34	XTMR9A21_		

① Underscore (_) indicates Magnetic Coil Suffix required. See **Table 21**.
② The factory installed reversing mini contactor includes (2) XTMC…10_ Contactors, (2) XTMCXFD11 1NO1NC Front Mount Auxiliary Contacts (1) XTMCXRL Reversing Link Kit and (1) XTMCXML Mechanical Interlock.

Table 20. Full Voltage Reversing Contactors with HORSEPOWER RATINGS

Operational Current AC-3 Amp Rating 380/400V	Conventional Free Air Thermal Current AC-1 at 50°C	Maximum 3-Phase Current Motor Rating							Spare Auxiliary Contacts		Catalog Number ③④	Price	
		1-Phase hp Ratings			3-Phase hp Ratings				K1M	K2M			
		115V	200V	230V	200V	230V	460V	575V				AC	DC
6.6	20	1/4	3/4	1	1-1/2	2	3	3	33 / 34	33 / 34	XTMR6A21_		
8.8	20	1/2	1	1-1/2	2	3	5	5	33 / 34	33 / 34	XTMR9A21_		

③ Underscore (_) indicates Magnetic Coil Suffix required. See **Table 21**.
④ The factory installed reversing mini contactor includes (2) XTMC…10_ Contactors, (2) XTMCXFD11 1NO1NC Front Mount Auxiliary Contacts (1) XTMCXRL Reversing Link Kit and (1) XTMCXML Mechanical Interlock.

Table 21. Magnet Coil Suffix

Coil Voltage	Suffix Code	Coil Voltage	Suffix Code ⑤	Coil Voltage	Suffix Code ⑤	Coil Voltage	Suffix Code ⑤⑥
110V 50 Hz, 120V 60 Hz	**A**	415V 50 Hz, 480V 60 Hz	**C**	400V 50 Hz	**N**	120V DC	**AD**
220V 50 Hz, 240V 60 Hz	**B**	550V 50 Hz, 600V 60 Hz	**D**	380V 60 Hz	**P**	220V DC	**BD**
230V 50 Hz	**F**	208V 60 Hz	**E**	12V 50/60 Hz	**R**	12V DC	**RD**
24V 50/60 Hz	**T**	190V 50 Hz, 220V 60 Hz	**G**	24V 50 Hz	**U**	48V DC	**WD**
24V DC	**TD** ⑥	240V 50 Hz, 277V 60 Hz	**H**	42V 50 Hz, 48V 60 Hz	**W**	—	—
—	—	380V 50 Hz, 440V 60 Hz	**L**	48V 50 Hz	**Y**	—	—

⑤ For indicated coils, price adder of 10% must be applied to the contactor list price in **Tables 19** and **20**.
⑥ With DC Operation: Integrated diode resistor combination, coil rating 2.6W.

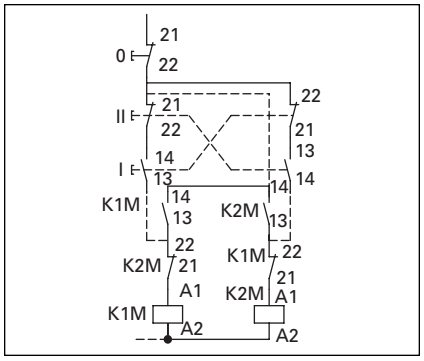


Figure 11. XTMR Reversing Contactor Control Wiring Diagram

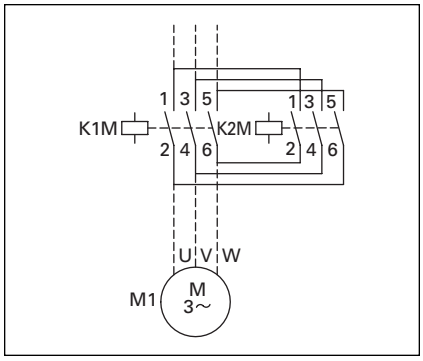


Figure 12. XTMR Reversing Contactor Power Wiring Diagram

Notes:

IEC Utilization Categories, see **Page 178**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.

AC-2: Squirrel-cage motors — starting, switching of motors during running.

AC-3: Squirrel-cage motors — starting, plugging, inching.

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Dimensions ..... **Page 27**
Discount Symbol **MC8**

Star-Delta (Wye-Delta) Miniature Contactors

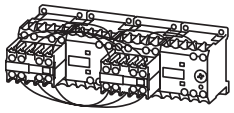
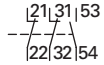


Table 22. Star-Delta (Wye-Delta) Miniature Contactor Configuration ①

Maximum kW Ratings AC-3			Maximum 3-Phase Current Motor Rating							Max. Changeover Time (sec.)	Spare Auxiliary Contacts	Component Catalog Number		Price	
3-Phase Motors 50 – 60 Hz			1-Phase hp Ratings			3-Phase hp Ratings						Description	Catalog Number ①		
220/230/240V	380/400/440V	500V	115V	200V	230V	200V	230V	460V	575V		K1M			AC	DC
4	5.5	5.5	1/2	1	1-1/2	2	3	5	7-1/2	30		K1M Main Contactor	**XTMC9A10_**		
												K1M Auxiliary Contact	**XTMCXFC22**		
												K5M Delta Contactor	**XTMC9A01_**		
												K3M Star Contactor	**XTMC9A10_**		
												K3M Auxiliary Contact	**XTMCXFC02**		
												K1T Timing Relay	**XTTR6A60S51B**		

① Operating Frequency: 30 Starts/hour
② Underscore (_) indicates magnet coil suffix required. See **Table 24**.

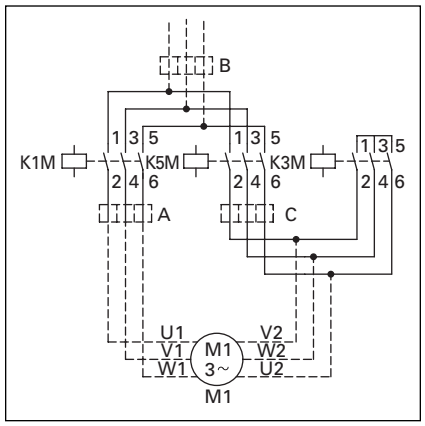


Figure 13. Star-Delta (Wye-Delta) Power Wiring Diagram

Table 23. Mini Overload Relay Settings (A)

Setting	Starting
A: I_N x 0.58	≤ = 15 sec
Motor Protection in the Y and Delta Configurations.	
B: I_N x 1	15 – 40 sec
Only partial motor protection in star position	
C: I_N x 0.58	> 40 sec
Motor not protected in star position.	
Timing Relay set to approximately 10 sec.	

Note: Depending on the coordination type required (i.e. Type 1 or Type 2) it must be established whether the fuse protection and the input wiring for the main and delta contactors are to be common or separate.

Table 24. Magnet Coil Suffix

Coil Voltage	Suffix Code	Coil Voltage	Suffix Code ③	Coil Voltage	Suffix Code ③	Coil Voltage	Suffix Code ③④
110V 50 Hz, 120V 60 Hz	**A**	415V 50 Hz, 480V 60 Hz	**C**	400V 50 Hz	**N**	120V DC	**AD**
220V 50 Hz, 240V 60 Hz	**B**	550V 50 Hz, 600V 60 Hz	**D**	380V 60 Hz	**P**	220V DC	**BD**
230V 50 Hz	**F**	208V 60 Hz	**E**	12V 50/60 Hz	**R**	12V DC	**RD**
24V 50/60 Hz	**T**	190V 50 Hz, 220V 60 Hz	**G**	24V 50 Hz	**U**	48V DC	**WD**
24V DC	**TD** ④	240V 50 Hz, 277V 60 Hz	**H**	42V 50 Hz, 48V 60 Hz	**W**	—	—
—	—	380V 50 Hz, 440V 60 Hz	**L**	48V 50 Hz	**Y**	—	—

③ For indicated coils, price adder of 10% must be applied to the contactor list price in **Table 22**.
④ With DC Operation: Integrated diode resistor combination, coil rating 2.6W.

Overload Relays . . . . . **Page 17**
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Dimensions . . . . . **Page 27**
Discount Symbol **MC8**

Overload Relays

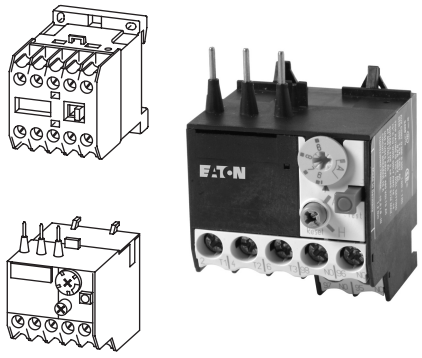
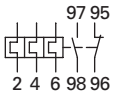


Table 25. Mini Overload Relays ①②

Overload Release I_r	Trip Class	Contact Sequence	Contact Configuration	Short Circuit Protection (A)				Catalog Number	Price
				Type 1 Coordination, gG/gL	Type 2 Coordination, gG/gL	Circuit Breaker	CEC/NEC Fuse		
0.1 – 0.16A	10A		1NO-1NC	20	0.5	15	—	**XTOMP16AC1**	
0.16 – 0.24A				20	1	15	—	**XTOMP24AC1**	
0.24 – 0.4A				20	2	15	—	**XTOMP40AC1**	
0.4 – 0.6A				20	2	15	—	**XTOMP60AC1**	
0.6 – 1A	10A		1NO-1NC	20	4	15	3	**XTOM001AC1**	
1 – 1.6A				20	6	15	6	**XTOM1P6AC1**	
1.6 – 2.4A				20	6	15	6	**XTOM2P4AC1**	
2.4 – 4A	10A		1NO-1NC	20	10	15	15	**XTOM004AC1**	
4 – 6A				20	10	15	20	**XTOM006AC1**	
6 – 9A				20	10	15	35	**XTOM009AC1**	
9 – 12A				—	—	—	45	**XTOM012AC1**	

① Short-circuit protection:
Observe the maximum permissible fuse of the contactor with direct device mounting. See **MN03402002E** for more information.

② When fitted directly to the contactor, a clearance of at least 5 mm is required between the overload relays.

Tripping Characteristics Chart

These tripping characteristics are mean values of the spread at 20°C ambient temperature in a cold state. Tripping time depends on response current. With devices at operating temperature, the tripping time of the overload relay reduces to approx. 25% of the read off value. Specific characteristics for each individual setting range can be found on **Page 25**.

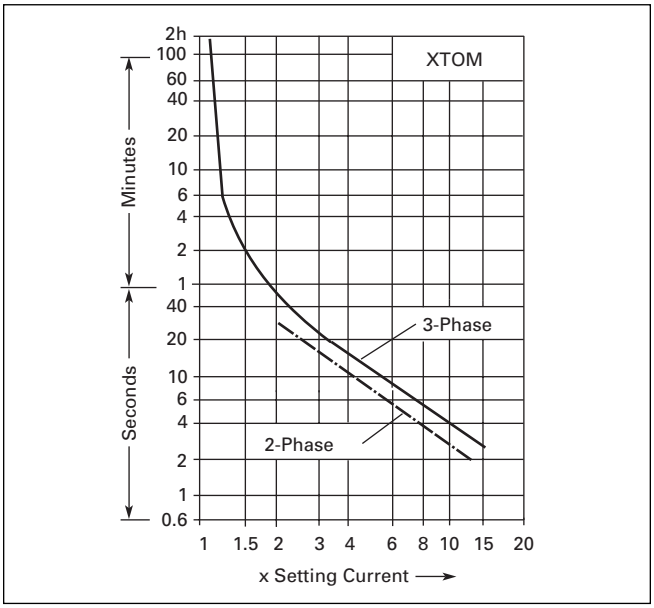


Figure 14. Tripping Characteristics

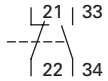
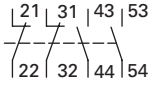
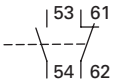
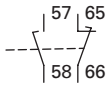
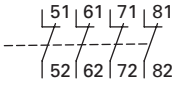
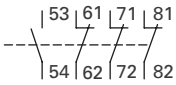
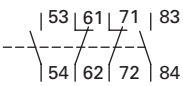
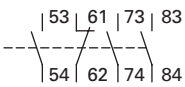
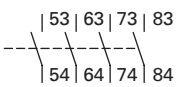
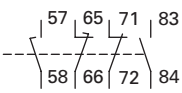
Dimensions ..... **Page 27**
Discount Symbol **MC8**

Accessories

Auxiliary Contacts

Front mounted snap-on auxiliary contacts for mini contactors are available with screw or spring cage terminals in a variety of contact configurations. Auxiliary contact modules are standard with interlocked opposing contacts, except in the case of early-make or late-break contacts.

Table 26. Front Mount Auxiliary Contacts for Use with Mini Contactors

Conventional free air thermal current, Ith = Ie, AC-1 in Amps	Contact Configuration	Contact Sequence	Package Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number	Price ②
10	0NO-2NC		5	**XTMCXFC02**	**—**	
10	1NO-1NC		5	**XTMCXFD11**	**XTMCXFDC11**	
10	2NO-2NC		5	**XTMCXFC22**	**XTMCXFCC22**	
10	0NO-2NC		5	**XTMCXFA02**	**—**	
10	1NO-1NC		5	**XTMCXFA11**	**XTMCXFAC11**	
10	2NO-0NC		5	**XTMCXFA20**	**—**	
10	1NO-1NC		5	**XTMCXFAL11** ①	**—**	
10	0NO-4NC		5	**XTMCXFA04**	**XTMCXFAC04**	
10	1NO-3NC		5	**XTMCXFA13**	**XTMCXFAC13**	
10	2NO-2NC		5	**XTMCXFA22**	**XTMXCFAC22**	
10	3NO-1NC		5	**XTMCXFA31**	**XTMCXFAC31**	
10	4NO-0NC		5	**XTMCXFA40**	**XTMCXFAC40**	
10	2NO-2NC		5	**XTMCXFAL22** ①	**XTMCXFCLC22** ①	

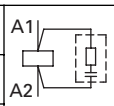
① 1 early-make contact, 1 late-break contact.

② Price listed is for a quantity of (1), orders must be placed in multiples of the package quantity listed.

Discount Symbol **MC8**

RC Suppressor

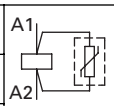
Table 27. RC Suppressor ①

Voltage	For Use With —	Circuit Symbol	Package Qty.	Catalog Number	Price ②
24 – 48	XTMC6A..., XTMC9A...		10	**XTMCXRSW**	
48 – 130	XTMC6A..., XTMC9A...		10	**XTMCXRSA**	
110 – 250	XTMC6A..., XTMC9A...		10	**XTMCXRSB**	
24 – 48	XTMCC6A..., XTMCC9A...		10	**XTMCXRSCW**	
48 – 130	XTMCC6A..., XTMCC9A...		10	**XTMCXRSCA**	
110 – 250	XTMCC6A..., XTMCC9A...		10	**XTMCXRSCB**	

① For AC operated contactors, 50/60 Hz. Note drop-out delay.
② Price listed is for a quantity of (1), orders must be placed in multiples of the package quantity listed.

Varistor Suppressor

Table 28. Varistor Suppressor ③

Voltage	For Use With —	Circuit Symbol	Package Qty.	Catalog Number	Price ④
24 – 48	XTMC6A..., XTMC9A...		10	**XTMCXVSW**	
48 – 130	XTMC6A..., XTMC9A...		10	**XTMCXVSA**	
110 – 250	XTMC6A..., XTMC9A...		10	**XTMCXVSB**	
380 – 415	XTMC6A..., XTMC9A...		10	**XTMCXVSN**	
24 – 48	XTMCC6A..., XTMC9A...		10	**XTMCXVSCW**	
48 – 130	XTMCC6A..., XTMC9A...		10	**XTMCXVSCA**	
110 – 250	XTMCC6A..., XTMC9A...		10	**XTMCXVSCB**	

③ For AC operated contactors, 50/60 Hz. DC operated contactors have integrated varistor suppressors.
④ Price listed is for a quantity of (1), orders must be placed in multiples of the package quantity listed.

Star-Delta (WYE-Delta) Bridge

Table 29. Star-Delta (WYE-Delta) Bridge

Contact Sequence	Package Qty.	Catalog Number	Price ⑥
	20	**XTMCXSDB** ⑤	

⑤ Protected against direct contact in accordance with IEC 536.
⑥ Price listed is for a quantity of (1), orders must be placed in multiples of the package quantity listed.

Star-Delta (WYE-Delta) Link Kit

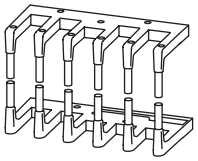


Table 30. Star-Delta (WYE-Delta) Link Kit

Description	Package Qty.	Catalog Number	Price
Main current wiring for star-delta (wye-delta) combinations. Includes the Star-Delta Bridge.	1	**XTMCXSDL** ⑦⑧	

⑦ The following control cables are integrated in addition to the electrical interlock:
K3M: A1 — K5M: 21; K3M: 21 — K5M: A1; K3M: A2 — K5M: A2
⑧ When combined with overload relay use separate mounting.

Paralleling Link Set for Main Contacts

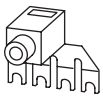


Table 31. Paralleling Link Set for Main Contacts

Contact Sequence	Package Qty.	Catalog Number	Price ⑫
	5	**XTMCXPLK** ⑨⑩⑪	

⑨ Protected against direct contact in accordance with IEC 536.
⑩ 4th pole can be broken off:
4-pole: Ith = 60A; 3-pole: Ith = 50A
⑪ AC-1 current carrying capacity of the open contactor increases by a factor of 2.5.
⑫ Price listed is for a quantity of (1), orders must be placed in multiples of the package quantity listed.

Discount Symbol **MC8**

Reversing Link Kit

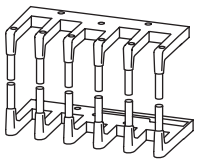


Table 32. Reversing Link Kit

Description	Package Qty.	Catalog Number	Price
Main current wiring for reversing contactors and starters.	1	**XTMCXRL** ①②	

① When combined with overload relay use separate mounting.
② The following control cables are integrated in addition to the electrical interlock:
K3M: A1 — K5M: 21; K3M: 21 — K5M: A1; K3M: A2 — K5M: A2

Mechanical Interlock

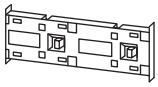


Table 33. Mechanical Interlock

Description	Package Qty.	Catalog Number	Price ④
Mechanical Interlock	5	**XTMCXML** ③	

③ For two contactors with AC or DC operated magnet system that are horizontally or vertically mounted, the distance between contactors is 0 mm, and the mechanical lifespan is 2.5 x 10^6 operations.
④ Price listed is for a quantity of (1), orders must be placed in multiples of the package quantity listed.

Connector

Table 34. Connector

Description	Package Qty.	Catalog Number	Price ⑥
For mechanically arranging contactors and timing relays in combinations.	50	**XTMCXCN** ⑤	

⑤ 0 mm distance between contactors.
⑥ Price listed is for a quantity of (1), orders must be placed in multiples of the package quantity listed.

IP40 Sealable Transparent Shroud

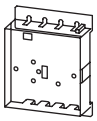


Table 35. IP40 Sealable Transparent Shroud

Description	Package Qty.	Catalog Number	Price
IP40 Sealable Transparent Shroud, snap fitting on mini contactor.	1	**XTMCXSHROUD**	

Technical Data and Specifications

Table 36. XT Miniature Controls — General Specifications

Description	XTMC6A…		XTMC9A…		XTMF9A…	
	Coils A – Y	Coils AD – WD	Coils A – Y	Coils AD – WD	Coils A – Y	Coils AD – WD
Physical and Electrical						
Standards	IEC/EN 60947, VDE 0660, CSA, UL, CCC					
Weights in kg [lb]	0.2 [0.44]	0.17 [0.37]	0.2 [0.44]	0.17 [0.34]	0.2 [0.44]	0.17 [0.37]
Mechanical Life — Operations	10,000,000	20,000,000	10,000,000	20,000,000	20,000,000	—
Mechanical Life — Coil @ 50 Hz	7	—	7	—	7	—
Maximum mechanical operating frequency (ops/hr)	9000					
Insulation Voltage (U_i) VAC	690	690	690	690	690	690
Impulse Withstand Voltage (U_{imp}) VAC	6000	6000	6000	6000	6000	6000
Operational Voltage (U_e) VAC	690	690	690	690	690	690
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 between coil and contacts (VAC) between contacts (VAC)	 300 300	 300 300	 300 300	 300 300	 300 300	 300 300
Making Capacity (amps)	110	110	110	110	110	110
Breaking Capacity (amps) 220/230V 380/400V 500V 660/690V	 90 90 64 54	 90 90 64 54	 90 90 64 54	 90 90 64 54	 90 90 64 54	 90 90 64 54
Short-Circuit Protection rating maximum fuse (gL/gG) Type 2 Coordination (A) Type 1 Coordination (A)	 10 20	 10 20	 10 20	 10 20	 10 20	 10 20
Degree of Protection	IP20					
Protection against direct contact when actuated from front (IEC 536)	Finger- and back-of-hand proof					
Terminal Capacity of main and auxiliary contacts Solid (mm^2)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Flexible with ferrule (mm^2)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)
Solid or Stranded (AWG)	18-14	18-14	18-14	18-14	18-14	18-14
Terminal Screw	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Posidrive screwdriver	Size 2	Size 2	Size 2	Size 2	Size 2	Size 2
Standard screwdriver (mm)	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6
Max. Tightening Torque Nm Lb-in	 1.2 10.6	 1.2 10.6	 1.2 10.6	 1.2 10.6	 1.2 10.6	 1.2 10.6
Terminal Capacity of spring cage main terminals Solid (mm^2)	 1 x (1 – 2.5) 2 x (1 – 2.5)	 1 x (1 – 2.5) 2 x (1 – 2.5)	 1 x (1 – 2.5) 2 x (1 – 2.5)	 1 x (1 – 2.5) 2 x (1 – 2.5)	 1 x (1 – 2.5) 2 x (1 – 2.5)	 1 x (1 – 2.5) 2 x (1 – 2.5)
Flexible with ferrule (mm^2)	1 x (1 – 2.5) 2 x (1 – 2.5)	1 x (1 – 2.5) 2 x (1 – 2.5)	1 x (1 – 2.5) 2 x (1 – 2.5)	1 x (1 – 2.5) 2 x (1 – 2.5)	1 x (1 – 2.5) 2 x (1 – 2.5)	1 x (1 – 2.5) 2 x (1 – 2.5)
Standard screwdriver (mm)	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
Mounting Position	As required, except vertical with terminals A1/A2 at the bottom					
Environmental						
Ambient Temperature	-25° to 50°C [-13° to 122°F]					
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 ms Contactor without auxiliary contact module Main contact — make contact Main contact — break/make contact Contactor with auxiliary contact module Main contact — make contact Main contact — make/break contact	 10g 10/8g 10g 20/20g	 10g 10/8g 10g 20/20g	 10g 10/8g 10g 20/20g	 10g 10/8g 10g 20/20g	 10g — 10g 20/20g	 10g — 10g 20/20g
Climatic Proofing	Damp heat, constant, to IEC 60 068-2-78; Damp heat, cyclic, to IEC 60 068-2-30					
Pollution Degree	III/3	III/3	III/3	III/3	III/3	III/3

Table 37. XT Miniature Controls — Magnet Systems

Description	XTMC6A…		XTMC9A…		XTMF9A…	
	Coils A – Y	Coils AD – WD	Coils A – Y	Coils AD – WD	Coils A – Y	Coils AD – WD
Voltage Tolerance						
Pick-Up (x U_c)						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	0.8 – 1.1	—	0.8 – 1.1	—	0.8 – 1.1	—
Dual frequency coil 50/60 Hz	0.85 – 1.1	—	0.85 – 1.1	—	0.85 – 1.1	—
DC operated ①	—	0.8 – 1.1	—	0.8 – 1.1	—	0.85 – 1.1
Power Consumption						
AC Operation						
Pick-Up VA						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	25	—	25	—	25	—
Dual frequency coil 50/60 Hz at 50 Hz	30	—	30	—	30	—
Dual frequency coil 50/60 Hz at 60 Hz	29	—	29	—	29	—
Pick-Up W						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	22	—	22	—	22	—
Dual frequency coil 50/60 Hz at 50 Hz	26	—	26	—	26	—
Dual frequency coil 50/60 Hz at 60 Hz	24	—	24	—	24	—
Sealing VA						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	4.6	—	4.6	—	4.6	—
Dual frequency coil 50/60 Hz at 50 Hz	5.4	—	5.4	—	5.4	—
Dual frequency coil 50/60 Hz at 60 Hz	3.9	—	3.9	—	3.9	—
Sealing W						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	1.3	—	1.3	—	1.3	—
Dual frequency coil 50/60 Hz at 50 Hz	1.6	—	1.6	—	1.6	—
Dual frequency coil 50/60 Hz at 60 Hz	1.1	—	1.1	—	1.1	—
DC operated ①						
Power consumption pick-up = sealing (VA/W)	—	2.6	—	2.6	—	2.6
Duty Factor (%)	100	100	100	100	100	100
Switching Time at 100% U_c						
Make Contact						
Closing delay min (mS)	14	26	14	26	14	26
Closing delay max (mS)	21	35	21	35	21	35
Opening delay min (mS)	8	15	8	15	8	15
Opening delay max (mS)	18	25	18	25	18	25
Closing delay with top mounting auxiliary contact (mS)	max. 45	max. 70	max. 45	max. 70	max. 45	max. 70
Reversing contactors						
Changeover time at 100% U_c						
Min (mS)	16	40	16	40	16	40
Max (mS)	21	50	21	50	21	50
Arcing time at 690V AC (mS)	max. 12	max. 12	max. 12	max. 12	max. 12	max. 12

① Smoothed DC or three-phase bridge rectifier.

Table 38. XT Miniature Controls

Description	XTMC6A…		XTMC9A…		XTMF9A…	
	Coils A – Y	Coils AD – WD	Coils A – Y	Coils AD – WD	Coils A – Y	Coils AD – WD
AC-1 Operation						
Conventional free air thermal current, 3-pole, 50 – 60 Hz (A)						
at 40°C (I_{th})	22	22	22	22	22	22
at 50°C (I_{th})	20	20	20	20	20	20
at 55°C (I_{th})	19	19	19	19	19	19
Conventional free air thermal current, 1-pole (I_{th})	50	50	50	50	60	60
AC-3 Operation						
Rated Operational Current, 50/60 Hz ① (I_e) in amperes (A)						
220/230V	6.6	6.6	9.0	9.0	9.0	9.0
240V	6.6	6.6	9.0	9.0	9.0	9.0
380/400V	6.6	6.6	9.0	9.0	9.0	9.0
415V	6.6	6.6	9.0	9.0	9.0	9.0
440V	6.6	6.6	9.0	9.0	9.0	9.0
500V	5	5	6.4	6.4	6.4	6.4
660/690V	3.5	3.5	4.8	4.8	4.8	4.8
Rated power (P) in kilowatts (kW)						
220/230V	1.5	1.5	2.2	2.2	2.2	2.2
240V	1.8	1.8	2.5	2.5	2.5	2.5
380/400V	3	3	4	4	4	4
415V	3.1	3.1	4.3	4.3	4.3	4.3
440V	3.3	3.3	4.6	4.6	4.6	4.6
500V	3	3	4	4	4	4
660/690V	3	3	4	4	4	4
AC-4 Operation						
Rated Operational Current, 50/60 Hz ① (I_e) in amperes (A)						
220/230V	5	5	6.6	6.6	6.6	6.6
240V	5	5	6.6	6.6	6.6	6.6
380/400V	5	5	6.6	6.6	6.6	6.6
415V	5	5	6.6	6.6	6.6	6.6
440V	5	5	6.6	6.6	6.6	6.6
500V	3.7	3.7	5	5	5	5
660/690V	2.9	2.9	3.4	3.4	3.4	3.4
Rated power (P) in kilowatts (kW)						
220/230V	1.1	1.1	1.5	1.5	1.5	1.5
240V	1.3	1.3	1.8	1.8	1.8	1.8
380/400V	2.2	2.2	3	3	3	3
415V	2.3	2.3	3.1	3.1	3.1	3.1
440V	2.4	2.4	3.3	3.3	3.3	3.3
500V	2.2	2.2	3	3	3	3
660/690V	2.2	2.2	3	3	3	3

① At maximum permissible ambient temperature.

Table 39. XT Miniature Controls

Description	XTMC6A…		XTMC9A…		XTMF9A…	
	Coils A – Y	Coils AD – WD	Coils A – Y	Coils AD – WD	Coils A – Y	Coils AD – WD
DC-1 Operation ②						
12V	20	20	20	20	—	—
24V	20	20	20	20	—	—
60V	20	20	20	20	—	—
110V	20	20	20	20	—	—
220V	20	20	20	20	—	—
DC-3 Operation ②						
12V	6	6	8	8	—	—
24V	6	6	8	8	—	—
60V	3	3	4	4	—	—
110V	2	2	3	3	—	—
220V	—	—	—	—	1	1
DC-4 Operation ②						
12V	1.8	1.8	2.5	2.5	—	—
24V	1.8	1.8	2.5	2.5	—	—
60V	1.8	1.8	2.5	2.5	—	—
110V	1.1	1.1	1.5	1.5	2.5	2.5
220V	0.2	0.2	0.3	0.3	1	1
Current Heat Loss (3- or 4-pole) in watts						
at I_{th}	2	3.5	2	3.5	2.7	4.7
at I_e to AC-3/400V	0.3	0.4	0.5	0.7	—	—

② Rated operation current (Ie) in amperes, at maximum permissible ambient temperature.

Table 40. XT Miniature Controls — Auxiliary Contacts

Description	XTMC6A…	XTMC9A…
Interlocked opposing contacts to ZH1/457, including auxiliary contact module	Yes	Yes
Rated impulse withstand voltage, U_{imp} (VAC)	6000	6000
Overvoltage category / pollution degree	III/3	III/3
Rated insulation voltage, U_i (VAC)	690	690
Rated operational voltage, U_e (VAC)	600	600
Safe isolation to VDE 0106 Part 101 and Part 101(A) in VAC between coil and auxiliary contacts between the auxiliary contacts	 300 300	 300 300
Rated Operational Current AC-15, I_e 220/240V 380/415V 500V DC-13 (Contacts in Series) 1: 24V 2: 60V 3: 100V 3: 220V	 6A 3A 1.5A 2.5A 2.5A 1.5A 0.5A	 6A 3A 1.5A 2.5A 2.5A 1.5A 0.5A
Conventional thermal current, I_{th}	10A	10A
Control circuit reliability (at U_e = 24 VDC, U_{min} = 17 V, I_{min} = 5.4 mA)	<10-8, < one failure at 100 million operations	
Component Lifespan at U_e = 240V AC-15, operations x 10^6 DC-13 L/R = 50 mS: 2 contacts in series at I_e = 0.5A, operations x 10^6	 0.2 0.15	 0.2 0.15
Short Circuit rating without welding Short Circuit protection rating maximum fuse, 500V gG/gL Short Circuit protection rating maximum fuse, 500V fast	 6A 10A	 6A 10A
Current heat loss at conventional free air thermal current I_{th} per contact, W	 0.2	 0.2

Electrical Switching Operation Charts

Squirrel-cage motors
Operating characteristics
Starting: from rest
Stopping: after attaining a full running speed
Electrical Characteristics —
Make (NO): Up to 6x rated motor current
Breaking (NC): 1x rated motor current

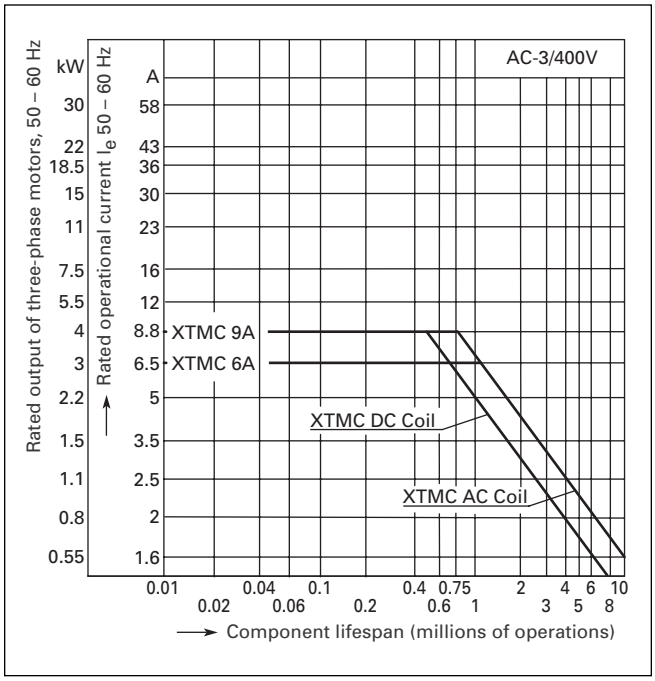


Figure 15. Normal Switching Duty — AC-3/400V

Squirrel-cage motors
Operating characteristics
Jogging, plugging, reversing
Electrical Characteristics —
Make (NO): 6x rated motor current
Breaking (NC): 6x rated motor current

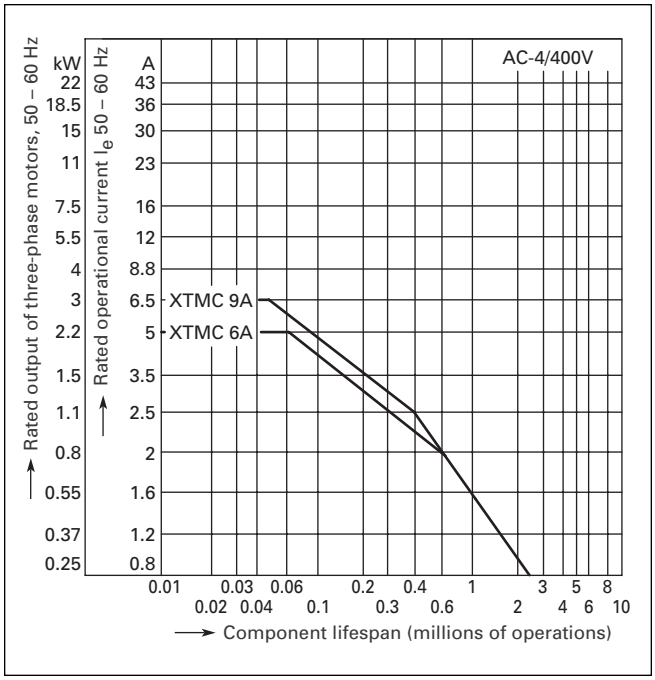


Figure 16. Extreme Switching Duty — AC-4/400V

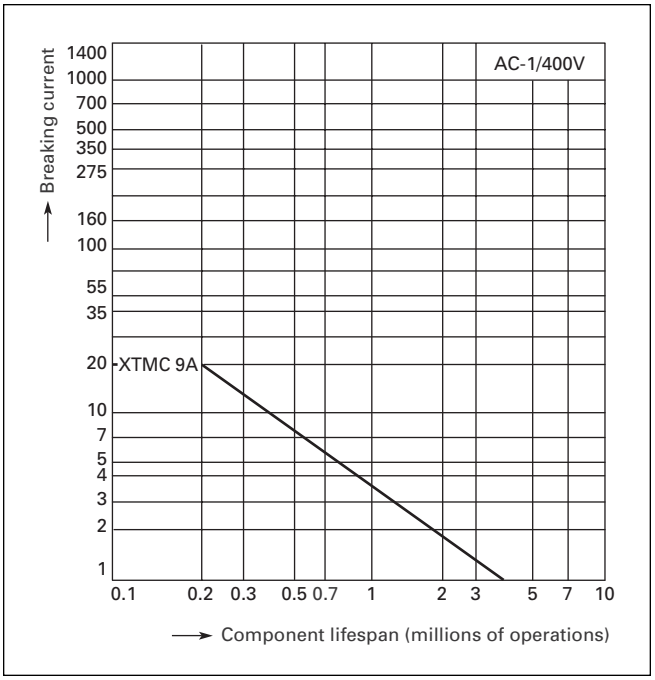


Figure 17. Switching Duty for Non-motor Loads, 3- & 4-Pole — AC-1/400V

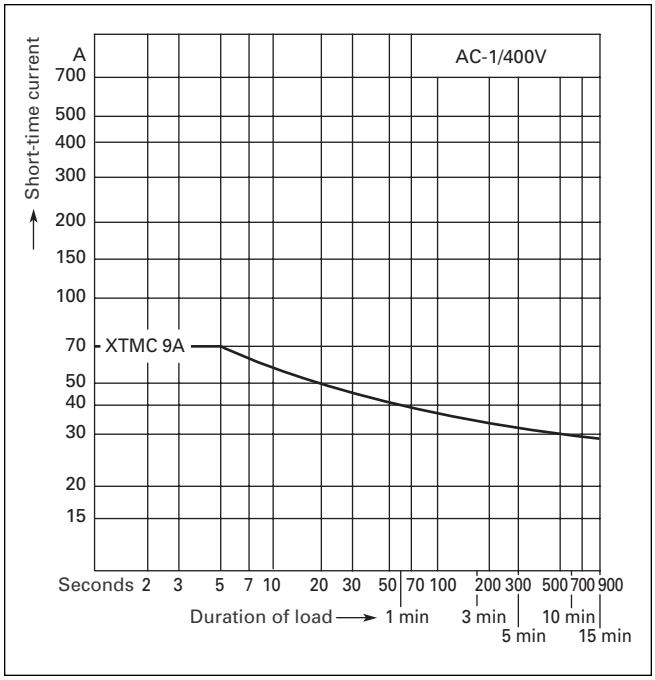


Figure 18. Short Time Loading, 3-Pole — AC-1/400V (time interval between two loading cycles: 15 minutes)

Dimensions

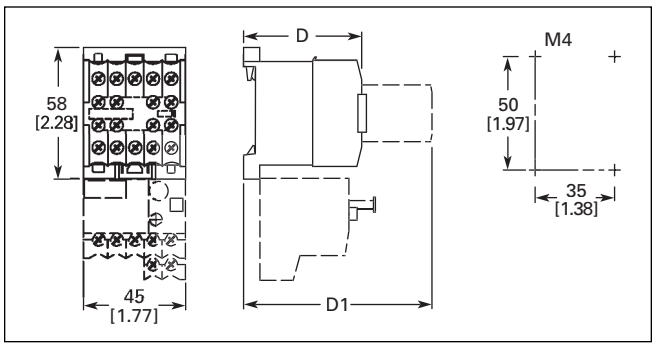


Figure 19. Non-reversing Mini Contactor

Table 41. Mini Contactor

	XTMC	XTMCC
D	52 [2.05]	54 [2.13]
D1	83 [3.27]	86 [3.39]

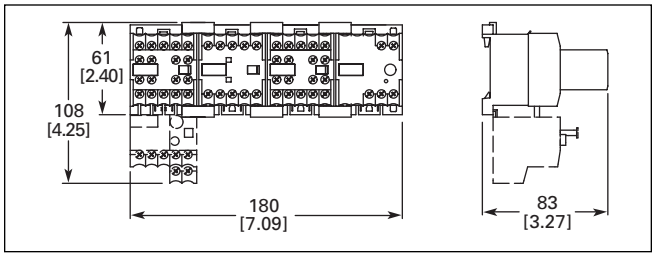


Figure 20. Star-Delta Starter Combinations

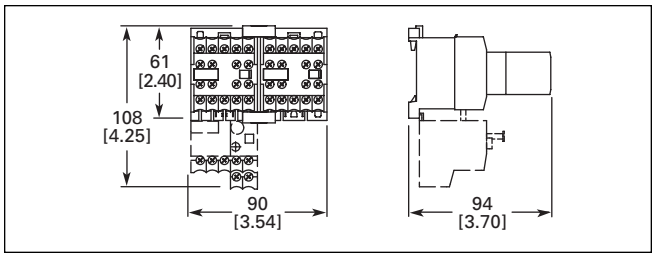


Figure 21. Reversing Mini Contactor

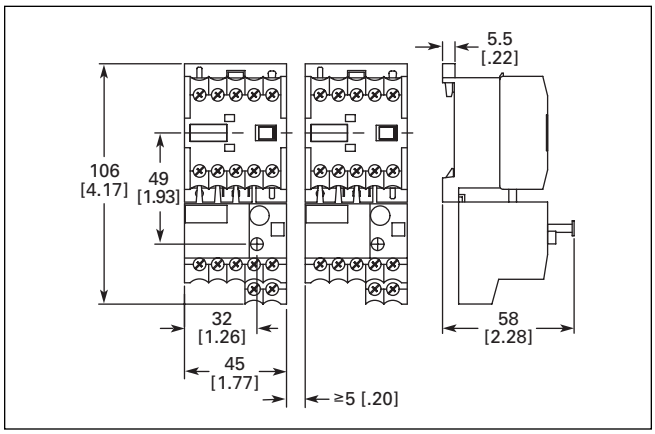


Figure 22. Non-reversing Mini Contactor with Overload Relay

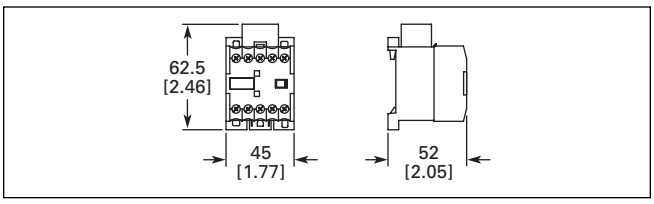


Figure 23. XTMCXRSA, XTMCXVSA Mini Suppressors — Approximate Dimensions in mm [in]

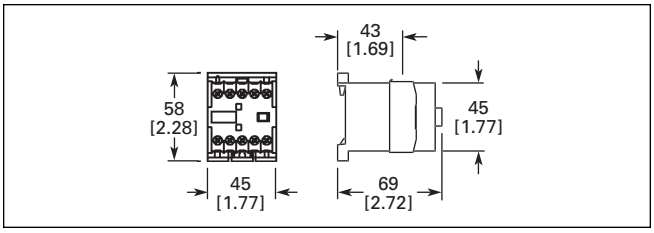


Figure 24. XTMCXTSA Mini Sealable Shroud — Approximate Dimensions in mm [in]

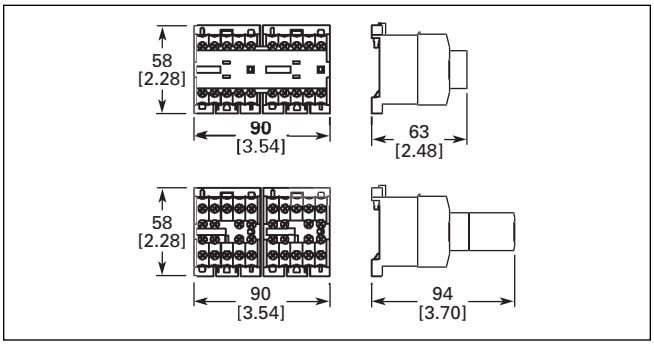


Figure 25. XTMCXML Mechanical Interlock — Approximate Dimensions in mm [in]

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XT Family of Contactors

Product Description

Eaton's new line of XT Contactors and Starters includes non-reversing and reversing contactors, overload relays and a variety of related accessories. Because XT meets IEC, UL, CSA, CCC and CE standards, it is the perfect product solution for IEC applications all over the world. The compact, space saving, and easy to install XT line of IEC contactors and starters is the efficient and effective solution for customer applications from 7A to 2000A.

Features and Benefits

- AC control from 12V to 600V 50/60 Hz
- DC control from 12V to 220V
- Available with screw or spring cage terminals
- Reversing or non-reversing contactors and starters
- AC-3 contactor ratings to 1000A and AC-1 contactor ratings to 2000A
- Non-reversing starters to 650A
- Panel or DIN rail mounting to 65A
- IP20 finger and back-of-hand proof
- Large ambient temperature range, -25 to 50°C [-13 to 122°F]
- AC and DC controlled contactors in the same compact frame
- Low power consumption DC coils
- Built-in NO or NC auxiliary contacts to 32A
- Plug-in accessories for reduced installation time

Standards and Certifications

- IEC EN 60947
- CE Approved
- UL
- CSA
- CCC (pending)
- ATEX (pending)

Instructional Leaflets

Pub51210	Inside of Packaging 7 – 15A B-Frame XTCE, XTCEC and XTCF Contactors and Accessories
Pub51211	Inside of Packaging 18 – 32A C-Frame XTCE and XTCEC Contactors and Accessories
Pub51221	Inside of Packaging XTOB D-Frame Overload Relays
Pub51222	Inside of Packaging XTOB B-C Frame Overload Relays
Pub51237	7 – 12A B-Frame XTCE Contactors and Auxiliary Contacts
Pub51232	18 – 32A C-Frame XTCE Contactors and Auxiliary Contacts
Pub51216	40 – 65A D-Frame XTCE Contactors and Auxiliary Contacts
Pub51203	185 – 500A L-M Frame XTCE Contactors and Auxiliary Contacts
Pub51215	S-Series 185 – 500A L-M Frame XTCE Contactors and Auxiliary Contacts
Pub51204	580 – 1000A N-Frame XTCE Contactors and Auxiliary Contacts
Pub51209	1400 – 2000A P-R Frame XTCE Contactors and Auxiliary Contacts
Pub51213	7 – 150A B-G Frame XTAE Non-reversing and XTAR Reversing Starters
Pub51217	XTCEXFA and XTCEXSA Front and Side Mount Auxiliary Contacts from 40 – 150A D-G Frame XTCE Contactors
Pub51212	XTCEXML Mechanical Interlock for 7 – 150A B-G Frame XTCE Contactors
Pub51214	XTCEXRL Reversing Link Kits for 18 – 32A C-Frame XTCE Contactors
Pub51218	XTCEXTL Lug Kits for 500 – 820A M-N Frame XTCE Contactors
Pub51219	XTCEXRLB and XTCEXSDLB Reversing and Star-Delta (Wye-Delta) Link Kits for 7 – 12A B-Frame XTCE Contactors
Pub51205	Accessories for 185 – 500A L-M Frame XTCE Contactors
Pub51207	Replacement DC Coils
Pub51213	Renewal Parts — Coils for 18 – 32A C-Frame XTCE Contactors
Pub51186	Renewal Parts — Coils for 40 – 65A D-Frame XTCE Contactors

Catalog Number Selection

Table 42. XT IEC Contactors & Starters — Catalog Numbering System

XT CE C 007 B 01 AD P16

Designation
XT = XT Line of IEC Control

Type
CE = 3-Pole FVNR IEC Contactor
CS = 3-Pole FVNR S Series IEC Contactor
CF = 4-Pole FVNR IEC Contactor
CR = 3-Pole FVR IEC Contactor
CC = IEC Capacitor Contactor
AE = FVNR IEC Starter
AS = FVNR S-Series IEC Starter
AR = FVR IEC Starter

Terminations	
Blank =	Screw Terminals (6 – 65A); 5 mm (80 – 150A); No Lugs (185 – 2000A)
C =	Spring Cage Terminals (6 – 32A); Spring Cage Coil Terminals Only (185 – 2000A)

Current Ratings, AC-3	Frame Size Designation	Auxiliary Contact
007 = 7A **009** = 9A **012** = 12A **015** = 15A	**B** = 45 mm	**01** = 1NC **10** = 1NO
018 = 18A **025** = 25A **032** = 32A	**C** = 45 mm	
040 = 40A **050** = 50A **065** = 65A	**D** = 55 mm	**00** = 0NO-0NC
080 = 80A **095** = 95A	**F** = 90 mm	
115 = 115A **150** = 150A	**G** = 90 mm	
185 = 185A **225** = 225A	**L** = 140 mm	**22** = 2NO-2NC
250 = 250A **300** = 300A **400** = 400A **500** = 500A	**M** = 160 mm	
580 = 580A **650 =** 650A **750** = 750A **820** = 820A **C10** = 1000A	**N** = 250 mm	
C14 = 1400A, AC-1	**P** = 260 mm	
C20 = 2000A, AC-1	**R** = 515 mm	

Maximum Overload Rating
XTAE, XTAS and XTAR Starters Only

Frame B
P16 = 0.1 – 0.16A
P24 = 0.16 – 0.24A
P40 = 0.24 – 0.4A
P60 = 0.4 – 0.6A
001 = 0.6 – 1A
1P6 = 1.0 – 1.6A
2P4 = 1.6 – 2.4A
004 = 2.4 – 4A
006 = 4 – 6A
010 = 6 – 10A
012 = 9 – 12A
016 = 12 – 16A

Frame C
P16 = 0.1 – 0.16A
P24 = 0.16 – 0.24A
P40 = 0.24 – 0.4A
P60 = 0.4 – 0.6A
001 = 0.6 – 1A
1P6 = 1.0 – 1.6A
2P4 = 1.6 – 2.4A
004 = 2.4 – 4A
006 = 4 – 6A
010 = 6 – 10A
016 = 10 – 16A
024 = 16 – 24A
032 = 24 – 32A

Frame D
010 = 6 – 10A
016 = 12 – 16A
024 = 16 – 24A
040 = 24 – 40A
057 = 40 – 57A
065 = 50 – 65A

Frame F
035 = 25 – 35A
050 = 35 – 50A
070 = 50 – 70A
100 = 70 – 100A

Frame G
035 = 25 – 35A
050 = 35 – 50A
070 = 50 – 70A
100 = 70 – 100A
125 = 95 – 125A
150 = 120 – 150A

Frame L
070 = 50 – 70A
100 = 70 – 100A
125 = 95 – 125A
160 = 120 – 160A
220 = 160 – 220A
250 = 200 – 250A

Frame M
063 = 42 – 63A
090 = 60 – 90A
125 = 85 – 125A
160 = 110 – 160A
240 = 160 – 240A
290 = 190 – 290A
400 = 270 – 400A
540 = 360 – 540A

Frame N
063 = 42 – 63A
090 = 60 – 90A
125 = 85 – 125A
160 = 110 – 160A
240 = 160 – 240A
290 = 190 – 290A
400 = 270 – 400A
540 = 360 – 540A
630 = 420 – 630A

Coil Codes
See **Page 32**.

Product Selection

Non-reversing Contactors

Table 43. Full Voltage Non-reversing 3-Pole Contactors

I_e (A)		Maximum kW Ratings AC-3					Maximum 3-Phase Motor Rating							Aux. Contacts	Catalog Number — Screw Terminals ①②③	Price	
AC-3	AC-1	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings			3-Phase hp Ratings						AC Coil	DC Coil
		220/ 230V	380/ 400V	415V	660/ 690V ⑦	1000V ⑦	115V	200V	230V	200V	230V	460V	575V				
Frame B																	
7	20	2.2	3	4	3.5	—	1/4	3/4	1	1-1/2	2	3	5	1NO	**XTCE007B10_**		
7	20	2.2	3	4	3.5	—	1/4	3/4	1	1-1/2	2	3	5	1NC	**XTCE007B01_**		
9	20	2.5	4	5.5	4.5	—	1/2	1	1-1/2	3	3	5	7-1/2	1NO	**XTCE009B10_**		
9	20	2.5	4	5.5	4.5	—	1/2	1	1-1/2	3	3	5	7-1/2	1NC	**XTCE009B01_**		
12	20	3.5	5.5	7	6.5	—	1	2	2	3	3	10 ⑧	10	1NO	**XTCE012B10_**		
12	20	3.5	5.5	7	6.5	—	1	2	2	3	3	10 ⑧	10	1NC	**XTCE012B01_**		
15.5	20	4	7.5	8	7	—	1	2	3	5	5	10 ⑧	10	1NO	**XTCE015B10_**		
15.5	20	4	7.5	8	7	—	1	2	3	5	5	10 ⑧	10	1NC	**XTCE015B01_**		
Frame C																	
18	35	5	7.5	10	11	—	2	2	3	5	5	10 ⑧	15	1NO	**XTCE018C10_**		
18	35	5	7.5	10	11	—	2	2	3	5	5	10 ⑧	15	1NC	**XTCE018C01_**		
25	40	7.5	11	14.5	14	—	2	3	5	7-1/2	7-1/2	15	20	1NO	**XTCE025C10_**		
25	40	7.5	11	14.5	14	—	2	3	5	7-1/2	7-1/2	15	20	1NC	**XTCE025C01_**		
32	40	10	15	18	17	—	3	5	5	10	10	20	25	1NO	**XTCE032C10_**		
32	40	10	15	18	17	—	3	5	5	10	10	20	25	1NC	**XTCE032C01_**		
Frame D																	
40	50	12.5	18.5	24	23	—	3	5	7-1/2	10	15	30	40	—	**XTCE040D00_**		
50	60	15.5	22	30	30	—	3	7-1/2	10	15	20	40	50	—	**XTCE050D00_**		
65	72	20	30	39	35	—	5	10	15	20	25	50	60	—	**XTCE065D00_**		
Frame F																	
80	110	25	37	48	63	45	7-1/2	15	15	25	30	60	75	—	**XTCE080F00_** ⑤		
95	110	30	45	57	75	55	7-1/2	15	15	25	40	75	100	—	**XTCE095F00_** ⑤		
Frame G																	
115	160	37	55	70	105	66	10	25	25	40	50	100	125	—	**XTCE115G00_** ⑤		
150	160	48	75	91	125	80	15	25	30	40	60	125	150	—	**XTCE150G00_** ⑤		
Frame L																	
185	275	55	90	110	175	108	—	—	—	50	60	125	150	2NO-2NC	**XTCE185L22_**		
225	315	70	110	132	215	108	—	—	—	60	75	150	200	2NO-2NC	**XTCE225L22_**		
250	350	75	132	148	240	108	—	—	—	75	100	200	250	2NO-2NC	**XTCE250L22_**		
Frame M																	
300	400	90	160	180	286	132	—	—	—	100	125	250	300	2NO-2NC	**XTCE300M22_**		
400	500	125	200	240	344	132	—	—	—	125	150	300	400	2NO-2NC	**XTCE400M22_**		
500	700	155	250	300	344	132	—	—	—	150	200	400	500	2NO-2NC	**XTCE500M22_**		
Frame N																	
580	800	185	315	348	560	600	—	—	—	200	200	400	600	2NO-2NC	**XTCE580N22_** ④		
650	850	205	355	390	630	600	—	—	—	200	250	500	600	2NO-2NC	**XTCE650N22_** ④		
750	900	240	400	455	720	800	—	—	—	250	300	600	700	2NO-2NC	**XTCE750N22_** ④		
820	1000	260	450	500	750	800	—	—	—	290	350	700	860	2NO-2NC	**XTCE820N22_** ④		
1000	1000	315	560	610	1000	1000	—	—	—	—	—	—	—	2NO-2NC	**XTCEC10N22_** ④		
Frame P																	
—	1400 ⑥	—	—	—	—	—	—	—	—	—	—	—	—	2NO-2NC	**XTCEC14P22_** ④		
Frame R																	
—	2000 ⑥	—	—	—	—	—	—	—	—	—	—	—	—	2NO-2NC	**XTCEC20R22_** ④		

① Underscore (_) indicates magnet coil suffix required. See **Table 48**.

② 7 – 150A DC operated contactors have an integrated suppressor. 185 – 2000A AC and DC contactors have an integrated suppressor.

③ For Spring Cage Terminals, insert **C** after the fourth digit of the Catalog Number. Example: XTCE**C**007B10A. For 7 – 15A XTCEC Contactors, the power, auxiliary and coil terminals are spring cage. For 18 – 32A XTCEC Contactors, the auxiliary and coil terminals are spring cage. For 40 – 150A XTCEC Contactors, the coil terminals only are spring cage. 185 – 2000A Contactors are available with screw terminals only.

④ When operating the 580 – 2000A XTCE contactors with frequency inverters, the suppressor on the load side must be removed. The load side suppressor must also be removed when performing a high-voltage test.

⑤ Available September 2005.

⑥ AC-1 Ratings Only.

⑦ For 185 – 2000A Contactors at 660/690V or 1000V: Do not reverse directly.

⑧ For electrical life contactor application data see **Table 45**.

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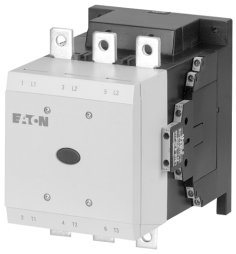
Contact Sequence (Circuit Symbols) ... **Page 31**
Discount Symbol **MC7**

Frame B

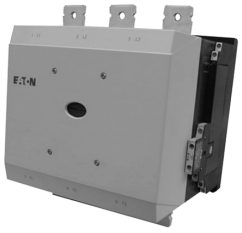
Frame C

Frame D

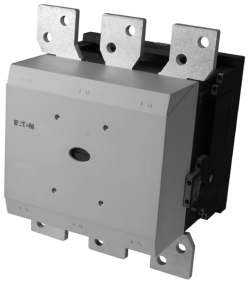
Frame F – G



Frame L



Frame N



Frame P

Frame R

Table 44. Full Voltage 3-Pole Non-reversing S-Series Contactors — AC Coils Only

I_e (A)		Maximum kW Ratings AC-3					Maximum 3-Phase Motor Rating						Auxiliary Contacts	Catalog Number — Screw Terminals ①②③	Price
AC-3	AC-1	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings		3-Phase hp Ratings						AC Coil
		220/ 230V	380/ 400V	415V	660/ 690V ④	1000V ④	115V	230V	200V	230V	460V	575V			
Frame L															
185	337	55	90	110	175	108	—	—	50	60	125	150	2NO-2NC	**XTCS185L22_**	
225	386	70	110	132	215	108	—	—	60	75	150	200	2NO-2NC	**XTCS225L22_**	
250	429	75	132	148	240	108	—	—	75	100	200	250	2NO-2NC	**XTCS250L22_**	
Frame M															
300	490	90	160	180	286	132	—	—	100	125	250	300	2NO-2NC	**XTCS300M22_**	
400	612	125	200	240	344	132	—	—	125	150	300	400	2NO-2NC	**XTCS400M22_**	
500	857	155	250	300	344	132	—	—	150	200	400	500	2NO-2NC	**XTCS500M22_**	

① Underscore (_) indicates magnet coil suffix required. See **Table 48**.
② 7 – 150A DC operated contactors have an integrated suppressor. 185 – 2000A AC and DC contactors have an integrated suppressor.
③ For Spring Cage Terminals, insert **C** after the fourth digit of the Catalog Number. Example: XTCE**C**007B10A. For 7 – 15A XTCEC Contactors, the power, auxiliary and coil terminals are spring cage. For 18 – 32A XTCEC Contactors, the auxiliary and coil terminals are spring cage. For 40 – 150A XTCEC Contactors, the coil terminals only are spring cage. 185 – 2000A Contactors are available with screw terminals only.
④ For 185 – 2000A Contactors at 660/690V or 1000V: Do not reverse directly.

Notes:
The 7 – 32A XTCE Contactors have positively driven contacts between the integrated auxiliary contact and the auxiliary contact module as well as within the auxiliary contact modules.

The 40 – 65A XTCE Contactors have positively driven contacts within the auxiliary contact module. 6 auxiliary contacts are possible with a combination of side mounted and front mount auxiliary contacts.

IEC Utilization Categories, see **Page 178**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel-cage motors — starting, switching of motors during running.

AC-4: Squirrel-cage motors — starting, plugging, inching.

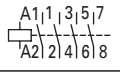
Table 45. Contactor Application Data ⑤

Catalog Prefix	AC-3	Electrical Life (Operations)
XTCE012B	12A	1 million
XTCE015B	15A	1.2 million
XTCE018C	18A	2 million

⑤ See **Figure 37** on **Page 76** for Electrical Life Curves.

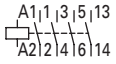
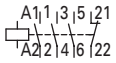
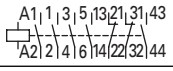
Coil Voltage Chart . . . . . **Page 32**
Accessories . . . . . **Page 47**
Dimensions . . . . . **Page 78**
Discount Symbol **MC7**

Table 46. Full Voltage 4-Pole Non-reversing Contactors with Screw Terminals

I_e (A)		Maximum kW Ratings AC-3					Maximum 3-Phase Motor Rating						Contact Sequence	Catalog Number ①	Price	
AC-3	AC-1	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings		3-Phase hp Ratings						AC Coil	DC Coil
		220/ 230V	380/ 400V	415V	660/ 690V	1000V	115V	230V	200V	230V	460V	575V				
	20													XTCF020B00_		

① Underscore (_) indicates magnet coil suffix required. See **Table 48**.

Table 47. Full Voltage Non-reversing 3-Pole Contactors — Contact Sequence (Circuit Symbols) — Standard Offering

Contactor Frame	Auxiliary Contacts	Contact Sequence
B – C	1NO	
B – C	1NC	
D – G	—	
L – R	2NO-2NC	

Notes:
The 7 – 32A XTCE Contactors have positively driven contacts between the integrated auxiliary contact and the auxiliary contact module as well as within the auxiliary contact modules.

The 40 – 65A XTCE Contactors have positively driven contacts within the auxiliary contact module. 6 auxiliary contacts are possible with a combination of side mounted and front mount auxiliary contacts.

IEC Utilization Categories, see **Page 178**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel-cage motors — starting, switching of motors during running.

AC-4: Squirrel-cage motors — starting, plugging, inching.

Table 48. Magnet Coil Suffix

Coil Voltage	Suffix Code
Frame A – B	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD** ③
415V 50 Hz, 480V 60 Hz	**C** ②
550V 50 Hz, 600V 60 Hz	**D** ②
208V 60 Hz	**E** ②
190V 50 Hz, 220V 60 Hz	**G** ②
240V 50 Hz, 277V 60 Hz	**H** ②
380V 50 Hz, 440V 60 Hz	**L** ②
400V 50 Hz	**N** ②
380V 60 Hz	**P** ②
12V 50/60 Hz	**R** ②
24V 50 Hz	**U** ②
42V 50 Hz, 48V 60 Hz	**W** ②
48V 50 Hz	**Y** ②
120V DC	**AD** ②③
220V DC	**BD** ②③
12V DC	**RD** ②③
48V DC	**WD** ②③

Coil Voltage	Suffix Code
Frame C – F	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ③
415V 50 Hz, 480V 60 Hz	**C** ②
550V 50 Hz, 600V 60 Hz	**D** ②
208V 60 Hz	**E** ②
190V 50 Hz, 220V 60 Hz	**G** ②
240V 50 Hz, 277V 60 Hz	**H** ②
380V 50 Hz, 440V 60 Hz	**L** ②
400V 50 Hz	**N** ②
380V 60 Hz	**P** ②
12V 50/60 Hz	**R** ②
24V 50 Hz	**U** ②
42V 50 Hz, 48V 60 Hz	**W** ②
48V 50 Hz	**Y** ②
110 – 130V DC	**AD** ②③
200 – 240V DC	**BD** ②③
12 – 14V DC	**RD** ②③④
48 – 60V DC	**WD** ②③

Coil Voltage	Suffix Code
Frame G	
100 – 120V 50/60 Hz	**A**
190 – 240V 50/60 Hz	**B**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ③
480 – 500V 50/60 Hz	**C** ②
380 – 440V 50/60 Hz	**L** ②
42 – 48V 50/60 Hz	**W** ②
110 – 130V DC	**AD** ②③
200 – 240V DC	**BD** ②③
48 – 60V DC	**WD** ②③
Frame L – N	
110 – 250V 40 – 60 Hz/DC	**A**
250 – 500V 40 – 60 Hz/DC	**C** ②
48 – 110V 40 – 60 Hz/DC	**Y** ②③
24 – 48V DC	**TD** ③
Frame L – N, S-Series	
110 – 120V 50/60 Hz	**A**
220 – 240V 50/60 Hz	**B**
Frame P – R	
220 – 250V 50 – 60 Hz/DC	**B**

② For indicated coils, price adder of 10% must be applied to the contactor list price in **Tables 43** – **46**.
③ With DC Operation: Integrated diode-resistor combination, coil rating 2.6W.
④ Available October 2005, Frame C – D only.

Discount Symbol MC7

Reversing Contactors

Frame B XTCR
Reversing Contactor

Table 49. Full Voltage Reversing Contactors with Screw Terminals

I_e (A)	Maximum kW Ratings AC-3				Maximum 3-Phase Motor Rating						Spare Auxiliary Contacts		Catalog Number ①②	Price	
AC-3	3-Phase Motors 50 – 60 Hz				1-Phase hp Ratings		3-Phase hp Ratings				K1M	K2M		AC Coil	DC Coil
	220/ 230V	380/ 400V	415V	660/ 690V	115V	230V	200V	230V	460V	575V					
Frame B															
7	2.2	3	4	3.5	1/4	1	1-1/2	2	3	5	63 64	63 64	**XTCR007B21_**		
9	2.5	4	5.5	4.5	1/2	1-1/2	2	3	5	7-1/2	63 64	63 64	**XTCR009B21_**		
12	3.5	5.5	7	6.5	1/2	2	3	3	7-1/2	10	63 64	63 64	**XTCR012B21_**		
Frame C															
18	5	7.5	8	11	2	3	5	5	10	15	63 64	63 64	**XTCR018C21_**		
25	7.5	11	14.5	14	2	5	7-1/2	7-1/2	15	20	63 64	63 64	**XTCR025C21_**		
32	10	15	18	17	3	5	10	10	20	25	63 64	63 64	**XTCR032C21_**		
Frame D															
40	12.5	18.5	24	23	3	7-1/2	10	15	30	40	—	—	**XTCR040D11_**		
50	15.5	22	30	30	3	10	15	20	40	50	—	—	**XTCR050D11_**		
65	20	30	39	35	5	15	20	25	50	60	—	—	**XTCR065D11_**		
Frame F															
80	25	37	48	63	7-1/2	15	25	30	60	75	—	—	**XTCR080F11_** ③		
95	30	45	57	75	7-1/2	15	25	40	75	100	—	—	**XTCR095F11_** ③		
Frame G															
115	37	55	70	105	10	25	40	50	100	125	—	—	**XTCR115G11_** ③		
150	48	75	91	125	15	30	40	60	125	150	—	—	**XTCR150G11_** ③		

① Underscore (_) indicates magnet coil suffix required. See **Table 50**.

② The factory assembled reversing contactor for the 7 – 32A devices includes: (2) XTCE…01_ Contactors, (2) XTCEXFAC20 2NO Seq. A Front Mount Auxiliary Contacts, (1) XTCEXRL Reversing Link Kit and (1) XTCEXML_ Mechanical Interlock. The factory assembled reversing contactor for the 40 – 150A devices includes: (2) XTCE…00_ Contactors and (2) XTCEXFBG11 1NO-1NC Seq. B Front Mount Auxiliary Contacts and (1) XTCEXML_ Mechanical Interlock.

③ Available September 2005.

Note:
IEC Utilization Categories, see **Page 178**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel-cage motors — starting, switching of motors during running.

AC-4: Squirrel-cage motors — starting, plugging, inching.

Coil Voltage Chart . . . . . **Page 34**
Accessories . . . . . **Page 47**
Dimensions . . . . . **Page 78**
Discount Symbol **MC7**

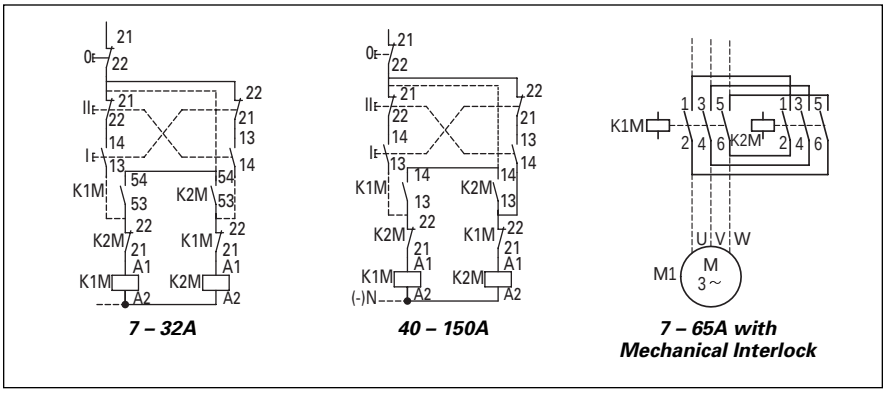
Table 50. Magnet Coil Suffix

Coil Voltage	Suffix Code
Frame A – B	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD** ②
415V 50 Hz, 480V 60 Hz	**C** ①
550V 50 Hz, 600V 60 Hz	**D** ①
208V 60 Hz	**E** ①
190V 50 Hz, 220V 60 Hz	**G** ①
240V 50 Hz, 277V 60 Hz	**H** ①
380V 50 Hz, 440V 60 Hz	**L** ①
400V 50 Hz	**N** ①
380V 60 Hz	**P** ①
12V 50/60 Hz	**R** ①
24V 50 Hz	**U** ①
42V 50 Hz, 48V 60 Hz	**W** ①
48V 50 Hz	**Y** ①
120V DC	**AD** ①②
220V DC	**BD** ①②
12V DC	**RD** ①②
48V DC	**WD** ①②

Coil Voltage	Suffix Code
Frame C – F	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ②
415V 50 Hz, 480V 60 Hz	**C** ①
550V 50 Hz, 600V 60 Hz	**D** ①
208V 60 Hz	**E** ①
190V 50 Hz, 220V 60 Hz	**G** ①
240V 50 Hz, 277V 60 Hz	**H** ①
380V 50 Hz, 440V 60 Hz	**L** ①
400V 50 Hz	**N** ①
380V 60 Hz	**P** ①
12V 50/60 Hz	**R** ①
24V 50 Hz	**U** ①
42V 50 Hz, 48V 60 Hz	**W** ①
48V 50 Hz	**Y** ①
110 – 130V DC	**AD** ①②
200 – 240V DC	**BD** ①②
12 – 14V DC	**RD** ①②③
48 – 60V DC	**WD** ①②

Coil Voltage	Suffix Code
Frame G	
100 – 120V 50/60 Hz	**A**
190 – 240V 50/60 Hz	**B**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ②
480 – 500V 50/60 Hz	**C** ①
380 – 440V 50/60 Hz	**L** ①
42 – 48V 50/60 Hz	**W** ①
110 – 130V DC	**AD** ①②
200 – 240V DC	**BD** ①②
48 – 60V DC	**WD** ①②
Frame L – N	
110 – 250V 40 – 60 Hz/DC	**A**
250 – 500V 40 – 60 Hz/DC	**C** ①
48 – 110V 40 – 60 Hz/DC	**Y** ①②
24 – 48V DC	**TD** ②
Frame L – N, S-Series	
110 – 120V 50/60 Hz	**A**
220 – 240V 50/60 Hz	**B**
Frame P – R	
220 – 250V 50 – 60 Hz/DC	**B**

① For indicated coils, price adder of 10% must be applied to the contactor list price in **Table 49**.
② With DC Operation: Integrated diode-resistor combination, coil rating 2.6W.
③ Available October 2005, Frame C – D only.



7 – 32A *40 – 150A* *7 – 65A with Mechanical Interlock*

Figure 26. 7 – 150A XTCR Reversing Contactor Wiring Diagram

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Discount Symbol **MC7**

Non-reversing Starters

Frame C XTAE
Non-reversing Starter

Table 51. Full Voltage Non-reversing 3-Pole Starters ③

I_e (A)		Maximum kW Ratings AC-3					Maximum 3-Phase Motor Rating						Auxiliary Contacts	Catalog Number ①②	Price	
AC-3	AC-1	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings		3-Phase hp Ratings						AC Coil	DC Coil
		220/ 230V	380/ 400V	415V	660/ 690V	1000V	115V	230V	200V	230V	460V	575V				
Frame B																
7	20	2.2	3	4	3.5	—	1/4	1	1-1/2	2	3	5	1NO	**XTAE007B10_ _**		
7	20	2.2	3	4	3.5	—	1/4	1	1-1/2	2	3	5	1NC	**XTAE007B01_ _**		
9	20	2.5	4	5.5	4.5	—	1/2	1-1/2	3	3	5	7-1/2	1NO	**XTAE009B10_ _**		
9	20	2.5	4	5.5	4.5	—	1/2	1-1/2	3	3	5	7-1/2	1NC	**XTAE009B01_ _**		
12	20	3.5	5.5	7	6.5	—	1	2	3	3	10 ④	10	1NO	**XTAE012B10_ _**		
12	20	3.5	5.5	7	6.5	—	1	2	3	3	10 ④	10	1NC	**XTAE012B01_ _**		
15.5	20	4	7.5	8	7	—	1	3	5	5	10 ④	10	1NO	**XTAE015B10_ _**		
15.5	20	4	7.5	8	7	—	1	3	5	5	10 ④	10	1NC	**XTAE015B01_ _**		
Frame C																
18	35	5	7.5	10	11	—	2	3	5	5	10 ④	15	1NO	**XTAE018C10_ _**		
18	35	5	7.5	10	11	—	2	3	5	5	10 ④	15	1NC	**XTAE018C01_ _**		
25	40	7.5	11	14.5	14	—	2	5	7-1/2	7-1/2	15	20	1NO	**XTAE025C10_ _**		
25	40	7.5	11	14.5	14	—	2	5	7-1/2	7-1/2	15	20	1NC	**XTAE025C01_ _**		
32	40	10	15	18	17	—	3	5	10	10	20	25	1NO	**XTAE032C10_ _**		
32	40	10	15	18	17	—	3	5	10	10	20	25	1NC	**XTAE032C01_ _**		
Frame D																
40	50	12.5	18.5	24	23	—	3	7-1/2	10	15	30	40	—	**XTAE040D00_ _**		
50	60	15.5	22	30	30	—	3	10	15	20	40	50	—	**XTAE050D00_ _**		
65	72	20	30	39	35	—	5	15	20	25	50	60	—	**XTAE065D00_ _**		
Frame F																
80	110	25	37	48	63	45	7-1/2	15	25	30	60	75	—	**XTAE080F00_ _**		
95	110	30	45	57	75	55	7-1/2	15	25	40	75	100	—	**XTAE095F00_ _**		
Frame G																
115	160	37	55	70	105	66	10	25	40	50	100	125	—	**XTAE115G00_ _**		
150	160	48	75	91	125	80	15	30	40	60	125	150	—	**XTAE150G00_ _**		
Frame L																
185	275	55	90	110	175	108	—	—	50	60	125	150	2NO-2NC	**XTAE185L22_ _**		
225	315	70	110	132	215	108	—	—	60	75	150	200	2NO-2NC	**XTAE225L22_ _**		
250	350	75	132	148	240	108	—	—	75	100	200	250	2NO-2NC	**XTAE250L22_ _**		
Frame M																
300	400	90	160	180	286	132	—	—	100	125	250	300	2NO-2NC	**XTAE300M22_ _**		
400	500	125	200	240	344	132	—	—	125	150	300	400	2NO-2NC	**XTAE400M22_ _**		
500	700	155	250	300	344	132	—	—	150	200	400	500	2NO-2NC	**XTAE500M22_ _**		
Frame N																
580	800	185	315	348	560	600	—	—	200	200	400	600	2NO-2NC	**XTAE580N22_ _**		
650	850	205	355	390	630	600	—	—	200	250	500	600	2NO-2NC	**XTAE650N22_ _**		

① Underscore (_) indicates magnet coil suffix required. See **Table 53**.
② Underscore (_) indicates overload relay suffix required. See **Table 55**.
③ Available August 2005.
④ For electrical life contactor application data see **Table 54**.

Notes:

IEC Utilization Categories, see **Page 178**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel-cage motors — starting, switching of motors during running.

AC-4: Squirrel-cage motors — starting, plugging, inching.

Coil Voltage Chart ..... **Page 36**
Accessories ..... **Page 47**
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Discount Symbol **MC7**

Table 52. Full Voltage Non-reversing S-Series 3-Pole Starters ③

I_e (A)		Maximum kW Ratings AC-3					Maximum 3-Phase Motor Rating						Catalog Number ①②	Price	
AC-3	AC-1	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings		3-Phase hp Ratings					AC Coil	DC Coil
		220/ 230V	380/ 400V	415V	660/ 690V	1000V	115V	230V	200V	230V	460V	575V			
Frame L															
185	337	55	90	110	175	108	—	—	50	60	125	150	**XTAS185L00_ _**		
225	386	70	110	132	215	108	—	—	60	75	150	200	**XTAS225L00_ _**		
250	429	75	132	148	240	108	—	—	75	100	200	250	**XTAS250L00_ _**		
Frame M															
300	490	90	160	180	286	132	—	—	100	125	250	300	**XTAS300M00_ _**		
400	612	125	200	240	344	132	—	—	125	150	300	400	**XTAS400M00_ _**		
500	857	155	250	300	344	132	—	—	150	200	400	500	**XTAS500M00_ _**		

① Underscore (_) indicates magnet coil suffix required. See **Table 53**.
② Underscore (_) indicates overload relay suffix required. See **Table 55**.
③ Available August 2005.

Table 53. Magnet Coil Suffix

Coil Voltage	Suffix Code
Frame A – B	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD** ⑤
415V 50 Hz, 480V 60 Hz	**C** ④
550V 50 Hz, 600V 60 Hz	**D** ④
208V 60 Hz	**E** ④
190V 50 Hz, 220V 60 Hz	**G** ④
240V 50 Hz, 277V 60 Hz	**H** ④
380V 50 Hz, 440V 60 Hz	**L** ④
400V 50 Hz	**N** ④
380V 60 Hz	**P** ④
12V 50/60 Hz	**R** ④
24V 50 Hz	**U** ④
42V 50 Hz, 48V 60 Hz	**W** ④
48V 50 Hz	**Y** ④
120V DC	**AD** ④⑤
220V DC	**BD** ④⑤
12V DC	**RD** ④⑤
48V DC	**WD** ④⑤

Coil Voltage	Suffix Code
Frame C – F	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ⑤
415V 50 Hz, 480V 60 Hz	**C** ④
550V 50 Hz, 600V 60 Hz	**D** ④
208V 60 Hz	**E** ④
190V 50 Hz, 220V 60 Hz	**G** ④
240V 50 Hz, 277V 60 Hz	**H** ④
380V 50 Hz, 440V 60 Hz	**L** ④
400V 50 Hz	**N** ④
380V 60 Hz	**P** ④
12V 50/60 Hz	**R** ④
24V 50 Hz	**U** ④
42V 50 Hz, 48V 60 Hz	**W** ④
48V 50 Hz	**Y** ④
110 – 130V DC	**AD** ④⑤
200 – 240V DC	**BD** ④⑤
12 – 14V DC	**RD** ④⑤⑥
48 – 60V DC	**WD** ④⑤

Coil Voltage	Suffix Code
Frame G	
100 – 120V 50/60 Hz	**A**
190 – 240V 50/60 Hz	**B**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ⑤
480 – 500V 50/60 Hz	**C** ④
380 – 440V 50/60 Hz	**L** ④
42 – 48V 50/60 Hz	**W** ④
110 – 130V DC	**AD** ④⑤
200 – 240V DC	**BD** ④⑤
48 – 60V DC	**WD** ④⑤
Frame L – N	
110 – 250V 40 – 60 Hz/DC	**A**
250 – 500V 40 – 60 Hz/DC	**C** ④
48 – 110V 40 – 60 Hz/DC	**Y** ④⑤
24 – 48V DC	**TD** ⑤
Frame L – N, S-Series	
110 – 120V 50/60 Hz	**A**
220 – 240V 50/60 Hz	**B**
Frame P – R	
220 – 250V 50 – 60 Hz/DC	**B**

④ For indicated coils, price adder of 10% must be applied to the contactor list price in **Tables 51** and **52.**
⑤ With DC Operation: Integrated diode-resistor combination, coil rating 2.6W. ⑤
⑥ Available October 2005, Frame C – D only.

Note:

IEC Utilization Categories, see **Page 178**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel-cage motors — starting, switching of motors during running.

AC-4: Squirrel-cage motors — starting, plugging, inching.

Table 54. Contactor Application Data ⑦

Catalog Prefix	AC-3	Electrical Life (Operations)
XTAE012B	12A	1 million
XTAE015B	15A	1.2 million
XTAE018C	18A	2 million

⑦ See **Figure 37** on **Page 76** for Electrical Life Curves.

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Discount Symbol **MC7**

Table 55. Overload Relay Suffix

Motor Full Load Amperes	Suffix Code	For use with Contactor Amp Range	Overload Relay Catalog Number
Frame B			
0.1 – 0.16	**P16**	7 – 15A	**XTOBP16BC1**
0.16 – 0.24	**P24**	7 – 15A	**XTOBP24BC1**
0.24 – 0.4	**P40**	7 – 15A	**XTOBP40BC1**
0.4 – 0.6	**P60**	7 – 15A	**XTOBP60BC1**
0.6 – 1	**001**	7 – 15A	**XTOB001BC1**
1 – 1.6	**1P6**	7 – 15A	**XTOB1P6BC1**
1.6 – 2.4	**2P4**	7 – 15A	**XTOB2P4BC1**
2.4 – 4	**004**	7 – 15A	**XTOB004BC1**
4 – 6	**006**	7 – 15A	**XTOB006BC1**
6 – 10	**010**	7 – 15A	**XTOB009BC1**
9 – 12	**012**	9 – 15A	**XTOB012BC1**
12 – 16	**016**	12 – 15A	**XTOB016BC1**
Frame C			
0.1 – 0.16	**P16**	18 – 32A	**XTOBP16CC1**
0.16 – 0.24	**P24**	18 – 32A	**XTOBP24CC1**
0.24 – 0.4	**P40**	18 – 32A	**XTOBP40CC1**
0.4 – 0.6	**P60**	18 – 32A	**XTOBP60CC1**
0.6 – 1	**001**	18 – 32A	**XTOB001CC1**
1 – 1.6	**1P6**	18 – 32A	**XTOB1P6CC1**
1.6 – 2.4	**2P4**	18 – 32A	**XTOB2P4CC1**
2.4 – 4	**004**	18 – 32A	**XTOB004CC1**
4 – 6	**006**	18 – 32A	**XTOB006CC1**
6 – 10	**010**	18 – 32A	**XTOB010CC1**
10 – 16	**016**	18 – 32A	**XTOB016CC1**
16 – 24	**024**	18 – 32A	**XTOB024CC1**
24 – 32	**032**	25 – 32A	**XTOB032CC1**
Frame D			
6 – 10	**010**	40 – 65A	**XTOB010DC1**
10 – 16	**016**	40 – 65A	**XTOB016DC1**
16 – 24	**024**	40 – 65A	**XTOB024DC1**
24 – 40	**040**	40 – 65A	**XTOB040DC1**
40 – 57	**057**	50 – 65A	**XTOB057DC1**
50 – 65	**065**	65A	**XTOB065DC1**
Frame F			
25 – 35	**035**	80 – 95A	**XTOB055GC1** ①
35 – 50	**050**	80 – 95A	**XTOB050GC1** ①
50 – 70	**070**	80 – 95A	**XTOB070GC1** ①
70 – 100	**100**	80 – 95A	**XTOB100GC1** ①
Frame G			
25 – 35	**035**	115 – 150A	**XTOB055GC1** ①
35 – 50	**050**	115 – 150A	**XTOB050GC1** ①
50 – 70	**070**	115 – 150A	**XTOB070GC1** ①
70 – 100	**100**	115 – 150A	**XTOB100GC1** ①
95 – 125	**125**	115 – 150A	**XTOB125GC1** ①
120 – 150	**150**	150A	**XTOB150GC1** ①
Frame L			
50 – 70	**070**	185 – 250A	**XTOB070LC1**
70 – 100	**100**	185 – 250A	**XTOB100LC1**
95 – 125	**125**	185 – 250A	**XTOB125LC1**
120 – 160	**160**	185 – 250A	**XTOB160LC1**
160 – 220	**220**	185 – 250A	**XTOB220LC1**
200 – 250	**250**	225 – 250A	**XTOB250LC1**
Frame M			
42 – 63	**063**	300 – 500A	**XTOT063C3S**
60 – 90	**090**	300 – 500A	**XTOT090C3S**
85 – 125	**125**	300 – 500A	**XTOT125C3S**
110 – 160	**160**	300 – 500A	**XTOT160C3S**
160 – 240	**240**	300 – 500A	**XTOT240C3S**
190 – 290	**290**	300 – 500A	**XTOT290C3S**
270 – 400	**400**	300 – 500A	**XTOT400C3S**
360 – 540	**540**	500A	**XTOT540C3S**
Frame N			
42 – 63	**063**	580 – 650A	**XTOT063C3S**
60 – 90	**090**	580 – 650A	**XTOT090C3S**
85 – 125	**125**	580 – 650A	**XTOT125C3S**
110 – 160	**160**	580 – 650A	**XTOT160C3S**
160 – 240	**240**	580 – 650A	**XTOT240C3S**
190 – 290	**290**	580 – 650A	**XTOT290C3S**
270 – 400	**400**	580 – 650A	**XTOT400C3S**
360 – 540	**540**	580 – 650A	**XTOT540C3S**
420 – 630	**630**	580 – 650A	**XTOT630C3S**

① Catalog Number refers to direct mount overload relay. Add an **S** to the end of the Catalog Number for separate mount.

Reversing Starters

Table 56. Full Voltage Reversing Starters with Screw Terminals ③

I_e (A)	Maximum kW Ratings AC-3				Maximum 3-Phase Motor Rating						Catalog Number ①②	Price	
AC-3	3-Phase Motors 50 – 60 Hz				1-Phase hp Ratings		3-Phase hp Ratings					AC Coil	DC Coil
	220/230V	380/400V	415V	660/690V	115V	230V	200V	230V	460V	575V			
Frame B													
7	2.2	3	4	3.5	1/4	1	1-1/2	2	3	5	**XTAR007B21_ _**		
9	2.5	4	5.5	4.5	1/2	1-1/2	3	3	5	7-1/2	**XTAR009B21_ _**		
12	3.5	5.5	7	6.5	1	2	3	3	10	10	**XTAR012B21_ _**		
Frame C													
18	5	7.5	8	11	2	3	5	5	10	15	**XTAR018C21_ _**		
25	7.5	11	14.5	14	2	5	7-1/2	7-1/2	15	20	**XTAR025C21_ _**		
32	10	15	18	17	3	5	10	10	20	25	**XTAR032C21_ _**		
Frame D													
40	12.5	18.5	24	23	3	7-1/2	10	15	30	40	**XTAR040D11_ _**		
50	15.5	22	30	30	3	10	15	20	40	50	**XTAR050D11_ _**		
65	20	30	39	35	5	15	20	25	50	60	**XTAR065D11_ _**		
Frame F													
80	25	37	48	63	7-1/2	15	25	30	60	75	**XTAR080F11_ _**		
95	30	45	57	75	7-1/2	15	25	40	75	100	**XTAR095F11_ _**		
Frame G													
115	37	55	70	105	10	25	40	50	100	125	**XTAR115G11_ _**		
150	48	75	91	125	15	30	40	60	125	150	**XTAR150G11_ _**		

① Underscore (_) indicates magnet coil suffix required. See **Table 57**.
② Underscore (_) indicates overload relay suffix required. See **Table 58**.
③ Available August 2005.

Table 57. Magnet Coil Suffix

Coil Voltage	Suffix Code
Frame A – B	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD** ⑤
415V 50 Hz, 480V 60 Hz	**C** ④
550V 50 Hz, 600V 60 Hz	**D** ④
208V 60 Hz	**E** ④
190V 50 Hz, 220V 60 Hz	**G** ④
240V 50 Hz, 277V 60 Hz	**H** ④
380V 50 Hz, 440V 60 Hz	**L** ④
400V 50 Hz	**N** ④
380V 60 Hz	**P** ④
12V 50/60 Hz	**R** ④
24V 50 Hz	**U** ④
42V 50 Hz, 48V 60 Hz	**W** ④
48V 50 Hz	**Y** ④
120V DC	**AD** ④⑤
220V DC	**BD** ④⑤
12V DC	**RD** ④⑤
48V DC	**WD** ④⑤

Coil Voltage	Suffix Code
Frame C – F	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ⑤
415V 50 Hz, 480V 60 Hz	**C** ④
550V 50 Hz, 600V 60 Hz	**D** ④
208V 60 Hz	**E** ④
190V 50 Hz, 220V 60 Hz	**G** ④
240V 50 Hz, 277V 60 Hz	**H** ④
380V 50 Hz, 440V 60 Hz	**L** ④
400V 50 Hz	**N** ④
380V 60 Hz	**P** ④
12V 50/60 Hz	**R** ④
24V 50 Hz	**U** ④
42V 50 Hz, 48V 60 Hz	**W** ④
48V 50 Hz	**Y** ④
110 – 130V DC	**AD** ④⑤
200 – 240V DC	**BD** ④⑤
12 – 14V DC	**RD** ④⑤⑥
48 – 60V DC	**WD** ④⑤

Coil Voltage	Suffix Code
Frame G	
100 – 120V 50/60 Hz	**A**
190 – 240V 50/60 Hz	**B**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ⑤
480 – 500V 50/60 Hz	**C** ④
380 – 440V 50/60 Hz	**L** ④
42 – 48V 50/60 Hz	**W** ④
110 – 130V DC	**AD** ④⑤
200 – 240V DC	**BD** ④⑤
48 – 60V DC	**WD** ④⑤
Frame L – N	
110 – 250V 40 – 60 Hz/DC	**A**
250 – 500V 40 – 60 Hz/DC	**C** ④
48 – 110V 40 – 60 Hz/DC	**Y** ④⑤
24 – 48V DC	**TD** ⑤
Frame L – N, S-Series	
110 – 120V 50/60 Hz	**A**
220 – 240V 50/60 Hz	**B**
Frame P – R	
220 – 250V 50 – 60 Hz/DC	**B**

④ For indicated coils, price adder of 10% must be applied to the contactor list price in **Table 56**.
⑤ With DC Operation: Integrated diode-resistor combination, coil rating 2.6W.
⑥ Available October 2005, Frame C – D only.

Note:
IEC Utilization Categories, see **Page 178**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.
AC-3: Squirrel-cage motors — starting switching of motors during running.
AC-4: Squirrel-cage motors — starting, plugging, inching.

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Table 58. Overload Relay Suffix

Motor Full Load Amperes	Suffix Code	For use with Contactor Amp Range	Overload Relay Catalog Number
Frame B			
0.1 – 0.16	**P16**	7 – 15A	**XTOBP16BC1**
0.16 – 0.24	**P24**	7 – 15A	**XTOBP24BC1**
0.24 – 0.4	**P40**	7 – 15A	**XTOBP40BC1**
0.4 – 0.6	**P60**	7 – 15A	**XTOBP60BC1**
0.6 – 1	**001**	7 – 15A	**XTOB001BC1**
1 – 1.6	**1P6**	7 – 15A	**XTOB1P6BC1**
1.6 – 2.4	**2P4**	7 – 15A	**XTOB2P4BC1**
2.4 – 4	**004**	7 – 15A	**XTOB004BC1**
4 – 6	**006**	7 – 15A	**XTOB006BC1**
6 – 10	**010**	7 – 15A	**XTOB009BC1**
9 – 12	**012**	9 – 15A	**XTOB012BC1**
12 – 16	**016**	12 – 15A	**XTOB016BC1**
Frame C			
0.1 – 0.16	**P16**	18 – 32A	**XTOBP16CC1**
0.16 – 0.24	**P24**	18 – 32A	**XTOBP24CC1**
0.24 – 0.4	**P40**	18 – 32A	**XTOBP40CC1**
0.4 – 0.6	**P60**	18 – 32A	**XTOBP60CC1**
0.6 – 1	**001**	18 – 32A	**XTOB001CC1**
1 – 1.6	**1P6**	18 – 32A	**XTOB1P6CC1**
1.6 – 2.4	**2P4**	18 – 32A	**XTOB2P4CC1**
2.4 – 4	**004**	18 – 32A	**XTOB004CC1**
4 – 6	**006**	18 – 32A	**XTOB006CC1**
6 – 10	**010**	18 – 32A	**XTOB010CC1**
10 – 16	**016**	18 – 32A	**XTOB016CC1**
16 – 24	**024**	18 – 32A	**XTOB024CC1**
24 – 32	**032**	25 – 32A	**XTOB032CC1**
Frame D			
6 – 10	**010**	40 – 65A	**XTOB010DC1**
10 – 16	**016**	40 – 65A	**XTOB016DC1**
16 – 24	**024**	40 – 65A	**XTOB024DC1**
24 – 40	**040**	40 – 65A	**XTOB040DC1**
40 – 57	**057**	50 – 65A	**XTOB057DC1**
50 – 65	**065**	65A	**XTOB065DC1**
Frame F			
25 – 35	**035**	80 – 95A	**XTOB055GC1** ①
35 – 50	**050**	80 – 95A	**XTOB050GC1** ①
50 – 70	**070**	80 – 95A	**XTOB070GC1** ①
70 – 100	**100**	80 – 95A	**XTOB100GC1** ①
Frame G			
25 – 35	**035**	115 – 150A	**XTOB055GC1** ①
35 – 50	**050**	115 – 150A	**XTOB050GC1** ①
50 – 70	**070**	115 – 150A	**XTOB070GC1** ①
70 – 100	**100**	115 – 150A	**XTOB100GC1** ①
95 – 125	**125**	115 – 150A	**XTOB125GC1** ①
120 – 150	**150**	150A	**XTOB150GC1** ①

① Catalog Number refers to direct mount overload relay. Add an **S** to the end of the Catalog Number for separate mount.

Star-Delta (Wye-Delta) Starters

Table 59. Star-Delta (Wye-Delta) Starters, 12 – 55A

I_e (A)	Maximum kW Ratings AC-3					Maximum 3-Phase current Motor Rating						Maximum Changeover Time (sec)	Components	
AC-3	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings		3-Phase hp Ratings					Description	Catalog Number ①
	220/ 230V	380/ 400V	415V	500V	660/ 690V	115V	230V	200V	230V	460V	575V			
Frame B														
12	3	5.5	7	5.5	5.5	1/2	2	3	3	2-1/2	10	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE007B10_** **XTCE007B01_** **XTCE007B01_** **XTTR6A60S51B** **XTOB…BC1** **XTCEXFAC20**
16	4	7.5	8	7.5	7.5	3/4	2	3	5	7-1/2	10	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE009B10_** **XTCE009B01_** **XTCE009B01_** **XTTR6A60S51B** **XTOB…BC1** **XTCEXFAC20**
22	5.5	11	14.5	11	11	2	3	5	5	10	15	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE012B10_** **XTCE012B01_** **XTCE012B01_** **XTTR6A60S51B** **XTOB…BC1** **XTCEXFAC20**
Frame C														
30	7.5	15	19	18.5	18.5	2	5	7-1/2	7-1/2	15	20	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE018C10_** **XTCE018C01_** **XTCE018C01_** **XTTR6A60S51B** **XTOB…CC1** **XTCEXFAC20**
45	11	22	30	30	22	3	7-1/2	10	15	30	40	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE025C10_** **XTCE025C01_** **XTCE025C01_** **XTTR6A60S51B** **XTOB…CC1** **XTCEXFAC20**
55	15	30	39	37	30	3	10	15	20	40	50	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE032C10_** **XTCE032C01_** **XTCE032C01_** **XTTR6A60S51B** **XTOB…CC1** **XTCEXFAC20**

① Underscore (_) indicates magnet coil suffix required. See **Table 65**.

Notes:

Main Circuit: Depending on the coordination type required (i.e. Type 1 or Type 2) it must be established whether the fuse protection and the input wiring for the main and delta contactors are to be common or separate.

Control Circuit: If the combinations are used in the scope of the IEC/EN 60 204-1, VDE 0113 part 1, point 9.1.1 regarding the supply of control circuits is to be observed.

IEC Utilization Categories, see **Page 178**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel-cage motors — starting, switching of motors during running.

AC-4: Squirrel-cage motors — starting, plugging, inching.

Table 60. Spare Auxiliary Contacts

K1M	K3M	K5M

Coil Voltage Chart ..... **Page 43**
Accessories ..... **Page 47**
Dimensions ..... **Page 78**
Discount Symbol **MC7**

Table 61. Star-Delta (Wye-Delta) Starters, 70 – 260A

I_e (A)	Maximum kW Ratings AC-3					Maximum 3-Phase current Motor Rating						Maximum Changeover Time (sec)	Components	
AC-3	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings		3-Phase hp Ratings					Description	Catalog Number ①
	220/ 230V	380/ 400V	415V	500V	660/ 690V	115V	230V	200V	230V	460V	575V			
Frame D														
70	18.5	37	37	45	37	5	15	20	25	50	60	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE040D10_** **XTCE040D00_** **XTCE040D00_** **XTTR6A60S51B** **XTOB…DC1** **XTCEXFBG11**
90	22	45	45	55	45	7-1/2	15	25	30	60	75	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE050D10_** **XTCE050D00_** **XTCE040D00_** **XTTR6A60S51B** **XTOB…DC1** **XTCEXFBG11**
115	30	55	55	75	55	10	25	40	50	100	125	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE065D10_** **XTCE065D00_** **XTCE040D00_** **XTTR6A60S51B** **XTOB…DC1** **XTCEXFBG11**
Frame F														
140	37	75	75	90	90	15	30	40	60	125	150	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE080F10_** **XTCE080F00_** **XTCE050D00_** **XTTR6A60S51B** **XTOB…FC1** **XTCEXFBG11**
165	45	90	110	110	132	15	30	40	60	125	150	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE095F10_** **XTCE095F00_** **XTCE065D00_** **XTTR6A60S51B** **XTOB…FC1** **XTCEXFBG11**
Frame G														
200	55	110	132	132	160	—	—	50	60	125	150	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE115G10_** **XTCE115G00_** **XTCE080F00_** **XTTR6A60S51B** **XTOB…GC1** **XTCEXFBG11**
260	75	132	148	160	200	—	—	75	100	200	250	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor K1T Timing Relay Overload Relay (2) Auxiliary Contacts	**XTCE150G10_** **XTCE150G00_** **XTCE080F00_** **XTTR6A60S51B** **XTOB…GC1** **XTCEXFBG11**

① Underscore (_) indicates magnet coil suffix required. See **Table 65**.

Notes:

Main Circuit: Depending on the coordination type required (i.e. Type 1 or Type 2) it must be established whether the fuse protection and the input wiring for the main and delta contactors are to be common or separate.

Control Circuit: If the combinations are used in the scope of the IEC/EN 60 204-1, VDE 0113 part 1, point 9.1.1 regarding the supply of control circuits is to be observed.

IEC Utilization Categories, see **Page 178**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel-cage motors — starting, switching of motors during running.

AC-4: Squirrel-cage motors — starting, plugging, inching.

Table 62. Spare Auxiliary Contacts

K1M	K3M	K5M

Coil Voltage Chart . . . . . **Page 43**
Accessories . . . . . **Page 47**
Dimensions . . . . . **Page 78**
Discount Symbol **MC7**

Table 63. Star-Delta (Wye-Delta) Starters, 315 – 1700A

I_e (A)	Maximum kW Ratings AC-3						Maximum 3-Phase current Motor Rating						Maximum Changeover Time (sec)	Components	
AC-3	3-Phase Motors 50 – 60 Hz						1-Phase hp Ratings		3-Phase hp Ratings					Description	Catalog Number ①
	220/ 230V	380/ 400V	415V	500V	660/ 690V	1000V	115V	230V	200V	230V	460V	575V			
Frame L															
315	90	160	180	200	250	132	—	—	100	125	250	300	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay K3M Auxiliary Contact	**XTCE185L22_** **XTCE185L22_** **XTCE115G00_** **XTTR6A60S51B** **XTOB…LC1** **XTCEXFBG22**
385	110	200	240	250	315	160	—	—	125	150	300	400	<20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay K3M Auxiliary Contact	**XTCE225L22_** **XTCE225L22_** **XTCE150G00_** **XTTR6A60S51B** **XTOB…LC1** **XTCEXFBG22**
430	132	250	300	315	400	200	—	—	125	150	300	400	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay	**XTCE250L22_** **XTCE250L22_** **XTCE185L22_** **XTTR6A60S51B** **XTOB…LC1**
Frame M															
515	160	300	348	355	450	200	—	—	150	200	400	500	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay	**XTCE300M22_** **XTCE300M22_** **XTCE185L00_** **XTTR6A60S51B** **XTOT…C3S**
685	200	355	390	450	560	220	—	—	200	250	500	600	<20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay	**XTCE400M22_** **XTCE400M22_** **XTCE250L00_** **XTTR6A60S51B** **XTOT…C3S**
860	250	450	500	560	600	220	—	—	290	350	700	860	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay	**XTCE500M22_** **XTCE500M22_** **XTCE300M00_** **XTTR6A60S51B** **XTOT…C3S**
Frame N															
1000	300	560	610	710	900	355	—	—	—	—	—	—	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay	**XTCE580N22_** **XTCE580N22_** **XTCE400M00_** **XTTR6A60S51B** **XTOT…C3S**
1120	350	630	680	750	950	355	—	—	—	—	—	—	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay	**XTCE650N22_** **XTCE650N22_** **XTCE400M00_** **XTTR6A60S51B** **XTOT…C3S**
1290	400	710	760	900	1200	1400	—	—	—	—	—	—	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay	**XTCE750N22_** **XTCE750N22_** **XTCE580N00_** **XTTR6A60S51B** **XTOT…C3S**
1400	450	800	850	950	1300	1400	—	—	—	—	—	—	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay	**XTCE820N22_** **XTCE820N22_** **XTCE580N00_** **XTTR6A60S51B** **XTOT…C3S**
1700	560	1000	1050	1200	1700	1700	—	—	—	—	—	—	<20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② K1T Timing Relay Overload Relay	**XTCEC10N22_** **XTCEC10N22_** **XTCE650N00_** **XTTR6A60S51B** **XTOT…C3S**

① Underscore (_) indicates magnet coil suffix required. See **Table 65**.

② If mechanical interlock of the star contactor is required, star contactor must be the same frame size as main and delta contactors.

Notes:

Main Circuit: Depending on the coordination type required (i.e. Type 1 or Type 2) it must be established whether the fuse protection and the input wiring for the main and delta contactors are to be common or separate.

Control Circuit: If the combinations are used in the scope of the IEC/EN 60 204-1, VDE 0113 part 1, point 9.1.1 regarding the supply of control circuits is to be observed.

IEC Utilization Categories, see **Page 178**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel-cage motors — starting, switching of motors during running.

AC-4: Squirrel-cage motors — starting, plugging, inching.

Table 64. Spare Auxiliary Contacts

K1M	K3M	K5M

Coil Voltage Chart ..... **Page 43**
Accessories ..... **Page 47**
Dimensions ..... **Page 78**
Discount Symbol **MC7**

Table 65. Magnet Coil Suffix

Coil Voltage	Suffix Code
Frame A – B	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD** ②
415V 50 Hz, 480V 60 Hz	**C** ①
550V 50 Hz, 600V 60 Hz	**D** ①
208V 60 Hz	**E** ①
190V 50 Hz, 220V 60 Hz	**G** ①
240V 50 Hz, 277V 60 Hz	**H** ①
380V 50 Hz, 440V 60 Hz	**L** ①
400V 50 Hz	**N** ①
380V 60 Hz	**P** ①
12V 50/60 Hz	**R** ①
24V 50 Hz	**U** ①
42V 50 Hz, 48V 60 Hz	**W** ①
48V 50 Hz	**Y** ①
120V DC	**AD** ①②
220V DC	**BD** ①②
12V DC	**RD** ①②
48V DC	**WD** ①②

Coil Voltage	Suffix Code
Frame C – F	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ②
415V 50 Hz, 480V 60 Hz	**C** ①
550V 50 Hz, 600V 60 Hz	**D** ①
208V 60 Hz	**E** ①
190V 50 Hz, 220V 60 Hz	**G** ①
240V 50 Hz, 277V 60 Hz	**H** ①
380V 50 Hz, 440V 60 Hz	**L** ①
400V 50 Hz	**N** ①
380V 60 Hz	**P** ①
12V 50/60 Hz	**R** ①
24V 50 Hz	**U** ①
42V 50 Hz, 48V 60 Hz	**W** ①
48V 50 Hz	**Y** ①
110 – 130V DC	**AD** ①②
200 – 240V DC	**BD** ①②
12 – 14V DC	**RD** ①②③
48 – 60V DC	**WD** ①②

Coil Voltage	Suffix Code
Frame G	
100 – 120V 50/60 Hz	**A**
190 – 240V 50/60 Hz	**B**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ②
480 – 500V 50/60 Hz	**C** ①
380 – 440V 50/60 Hz	**L** ①
42 – 48V 50/60 Hz	**W** ①
110 – 130V DC	**AD** ①②
200 – 240V DC	**BD** ①②
48 – 60V DC	**WD** ①②
Frame L – N	
110 – 250V 40 – 60 Hz/DC	**A**
250 – 500V 40 – 60 Hz/DC	**C** ①
48 – 110V 40 – 60 Hz/DC	**Y** ①②
24 – 48V DC	**TD** ②
Frame L – N, S-Series	
110 – 120V 50/60 Hz	**A**
220 – 240V 50/60 Hz	**B**
Frame P – R	
220 – 250V 50 – 60 Hz/DC	**B**

① For indicated coils, price adder of 10% must be applied to the contactor list price in **Tables 59, 61** and **63**.
② With DC Operation: Integrated diode-resistor combination, coil rating 2.6W.
③ Available October 2005, Frame C – D only.

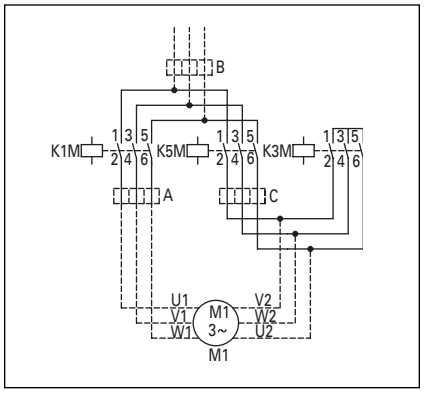


Figure 27. Wiring Diagram

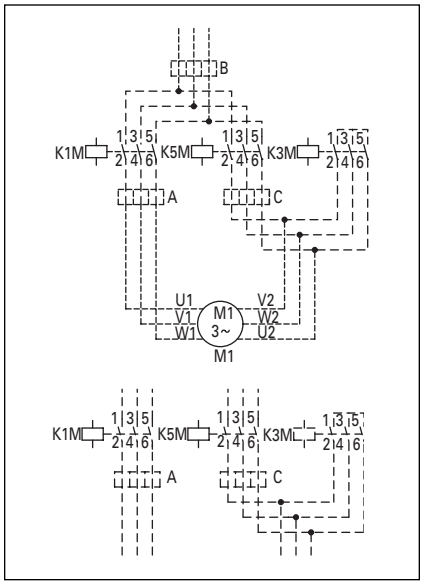


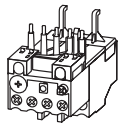
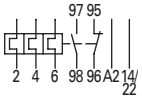
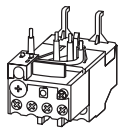
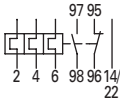
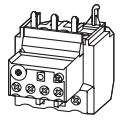
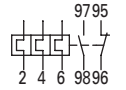
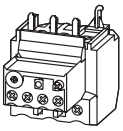
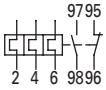
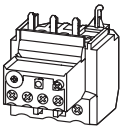
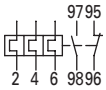
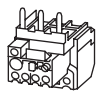
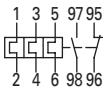
Figure 28. Wiring Diagram

Table 66. Overload Relay Settings (A)

Setting	Starting
A: I_N x 0.58 Motor Protection in the Star and Delta Configurations	≤ 15 sec
B: I_N x 1 Only partial motor protection in star position	15 – 40 sec
C: I_N x 0.58 Motor not protected in star position Timing Relay set to approximately 10 sec	> 40 sec

Overload Relays

Table 67. Overload Relay ①②

	Overload Releases, I_r	Contact Sequence	Contact Configuration	For use with Contactor Amp Range	Short-circuit protection (A)				Catalog Number	Price
					Type 1 Coordination, gG/gL	Type 2 Coordination, gG/gL	Circuit Breaker	CEC/NEC Fuse		
Frame B — Direct Mount										
	0.1 – 16A		1NO-1NC	7 – 15A	25	0.5	15	3	**XTOBP16BC1**	
	0.16 – 0.24A		1NO-1NC	7 – 15A	25	1	15	3	**XTOBP24BC1**	
	0.24 – 0.4A		1NO-1NC	7 – 15A	25	2	15	3	**XTOBP40BC1**	
	0.4 – 0.6A		1NO-1NC	7 – 15A	25	4	15	3	**XTOBP60BC1**	
	0.6 – 1A		1NO-1NC	7 – 15A	25	4	15	3	**XTOB001BC1**	
	1 – 1.6A		1NO-1NC	7 – 15A	25	6	15	6	**XTOB1P6BC1**	
	1.6 – 2.4A		1NO-1NC	7 – 15A	25	10	15	6	**XTOB2P4BC1**	
	2.4 – 4A		1NO-1NC	7 – 15A	25	16	15	15	**XTOB004BC1**	
	4 – 6A		1NO-1NC	7 – 15A	25	20	15	20	**XTOB006BC1**	
	6 – 10A		1NO-1NC	7 – 15A	50	25	15	35	**XTOB010BC1**	
	9 – 12A		1NO-1NC	12 – 15A	50	25	15	45	**XTOB012BC1**	
	12 – 16		1NO-1NC	15A	—	—	15	45	**XTOB016BC1**	
Frame C — Direct Mount										
	0.1 – 0.16		1NO-1NC	18 – 32A	25	0.5	25	3	**XTOBP16CC1**	
	0.16 – 0.24		1NO-1NC	18 – 32A	25	1	25	3	**XTOBP24CC1**	
	0.24 – 0.4		1NO-1NC	18 – 32A	25	2	25	3	**XTOBP40CC1**	
	0.4 – 0.6		1NO-1NC	18 – 32A	25	4	25	3	**XTOBP60CC1**	
	0.6 – 1		1NO-1NC	18 – 32A	25	4	25	3	**XTOB001CC1**	
	1 – 1.6		1NO-1NC	18 – 32A	25	6	25	6	**XTOB1P6CC1**	
	1.6 – 2.4		1NO-1NC	18 – 32A	25	10	25	6	**XTOB2P4CC1**	
	2.4 – 4		1NO-1NC	18 – 32A	25	16	25	15	**XTOB004CC1**	
	4 – 6		1NO-1NC	18 – 32A	25	20	25	20	**XTOB006CC1**	
	6 – 10		1NO-1NC	18 – 32A	50	25	25	25	**XTOB010CC1**	
	10 – 16		1NO-1NC	18 – 32A	63	35	30	25	**XTOB016CC1**	
	16 – 24		1NO-1NC	18 – 32A	100	35	30	25	**XTOB024CC1**	
	24 – 32		1NO-1NC	25 – 32A	125	63	30	25	**XTOB032CC1**	
Frame D — Direct Mount										
	6 – 10		1NO-1NC	40 – 65A	50	25	25	25	**XTOB010DC1**	
	10 – 16		1NO-1NC	40 – 65A	63	35	25	25	**XTOB016DC1**	
	16 – 24		1NO-1NC	40 – 65A	63	50	30	25	**XTOB024DC1**	
	24 – 40		1NO-1NC	40 – 65A	125	63	125	125	**XTOB040DC1**	
	40 – 57		1NO-1NC	50 – 65A	160	80	150	150	**XTOB057DC1**	
	50 – 65		1NO-1NC	65A	160	100	150	200	**XTOB065DC1**	
Frame F – G — Direct Mount										
	25 – 35		1NO-1NC	115 – 150A	125	100	125	125	**XTOB035GC1**	
	35 – 50		1NO-1NC	115 – 150A	160	125	150	200	**XTOB050GC1**	
	50 – 70		1NO-1NC	115 – 150A	250	160	150	200	**XTOB070GC1**	
	70 – 100		1NO-1NC	115 – 150A	315	200	400	400	**XTOB100GC1**	
	95 – 125		1NO-1NC	115 – 150A	315	250	500	400	**XTOB125GC1**	
	120 – 150		1NO-1NC	150A	315	250	600	600	**XTOB150GC1**	
Frame F – G — Separate Mount										
	25 – 35		1NO-1NC	115 – 150A	125	100	125	125	**XTOB035GC1S**	
	35 – 50		1NO-1NC	115 – 150A	160	125	150	200	**XTOB050GC1S**	
	50 – 70		1NO-1NC	115 – 150A	250	160	150	200	**XTOB070GC1S**	
	70 – 100		1NO-1NC	115 – 150A	315	200	400	400	**XTOB100GC1S**	
	95 – 125		1NO-1NC	115 – 150A	315	250	500	400	**XTOB125GC1S**	
	120 – 150		1NO-1NC	150A	315	250	600	600	**XTOB150GC1S**	
Frame L										
	50 – 70		1NO-1NC	185 – 250A	250	160	150	200	**XTOB070LC1**	
	70 – 100		1NO-1NC	185 – 250A	315	200	400	400	**XTOB100LC1**	
	95 – 125		1NO-1NC	185 – 250A	315	250	500	400	**XTOB125LC1**	
	120 – 160		1NO-1NC	185 – 250A	400	250	600	600	**XTOB160LC1**	
	160 – 220		1NO-1NC	185 – 250A	400 ③	315 ③	800	800	**XTOB220LC1**	
	200 – 250		1NO-1NC	225 – 250A	400 ③	315 ③	600	700	**XTOB250LC1**	

① Short circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. See MN03402001E for more information on overload relays for frames B – G.

② Trip Class: 10A

③ For separate mounting, short circuit Type 1 rating is 500A and short circuit Type 2 rating is 400A.

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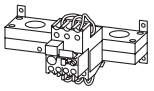
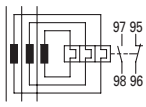
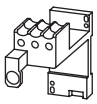
Table 68. Current Transformer Operated Overload Relays ①

	Overload Releases, I_r	Contact Sequence	Contact Configu-ration	For use with Contactor Amp Range	Short-circuit protection (A)				Catalog Number	Price
					Type 1 Coordi-nation, gG/gL	Type 2 Coordi-nation, gG/gL	Circuit Breaker	CEC/NEC Fuse		
Frame M – N — Separate Mount										
	42 – 63		1NO-1NC	300 – 500A	—	—	150	200	**XTOT063C3S**	
	60 – 90		1NO-1NC	300 – 500A	—	—	250	250	**XTOT090C3S**	
	85 – 125		1NO-1NC	300 – 500A	—	—	500	400	**XTOT125C3S**	
	110 – 160		1NO-1NC	300 – 500A	—	—	600	600	**XTOT160C3S**	
	160 – 240		1NO-1NC	300 – 500A	—	—	600	700	**XTOT240C3S**	
	190 – 290		1NO-1NC	300 – 500A	—	—	600	700	**XTOT290C3S**	
	270 – 400		1NO1-NC	300 – 500A	—	—	1000	1000	**XTOT400C3S**	
	360 – 540		1NO-1NC	500A	—	—	600	1000	**XTOT540C3S**	

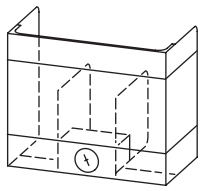
① The main current parameters are defined by the main current wiring which is used.

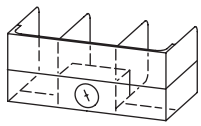
Table 69. DIN Rail or Panel Mount Adapter, Frames C – D ②

	For use with …	Catalog Number	Price
	XTOB…CC1	**XTOBXDINC**	
	XTOB…DC1	**XTOBXDIND**	

② Can be snap fitted on a top hat rail (DIN rail) to IEC/EN 60715 or can be screw fitted.

Table 70. Terminal Shroud

	For use with …	Catalog Number	Price
	XTOB…LC1	**XTOBXTSL**	

	For direct mounting of …	Catalog Number	Price
	XTOB…LC1 to XTCE185L, XTCE225L or XTCE250L	**XTOBXTSCL**	

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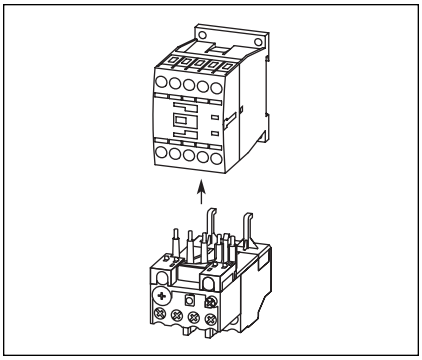


Figure 29. Frame B — Overload Fitted Directly to the Contactor

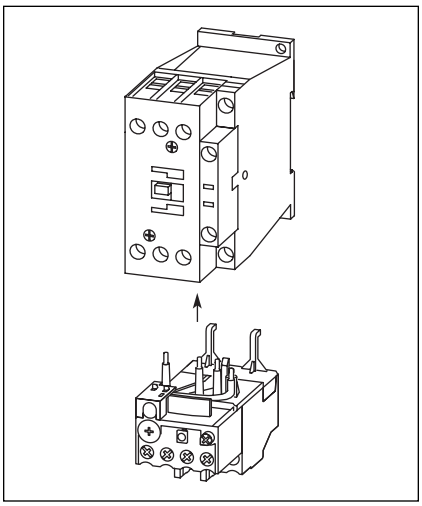


Figure 30. Frame C — Overload Fitted Directly to the Contactor

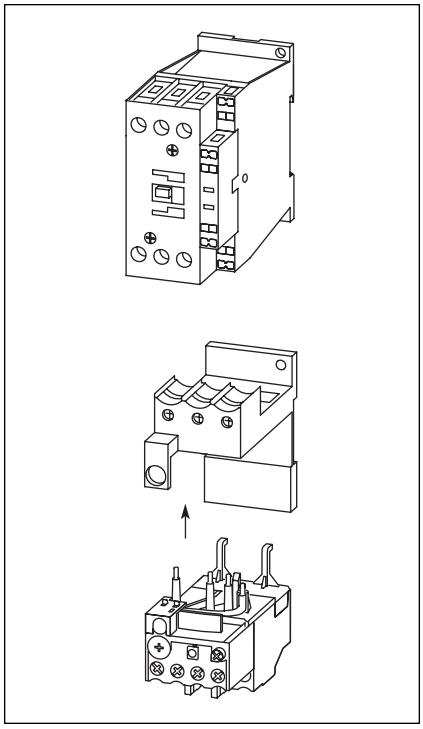


Figure 31. Frame C — Overload Mounted Separately from the Contactor

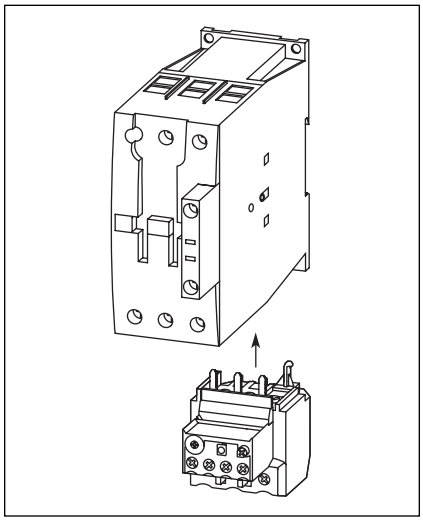


Figure 32. Frame D — Overload Fitted Directly to the Contactor

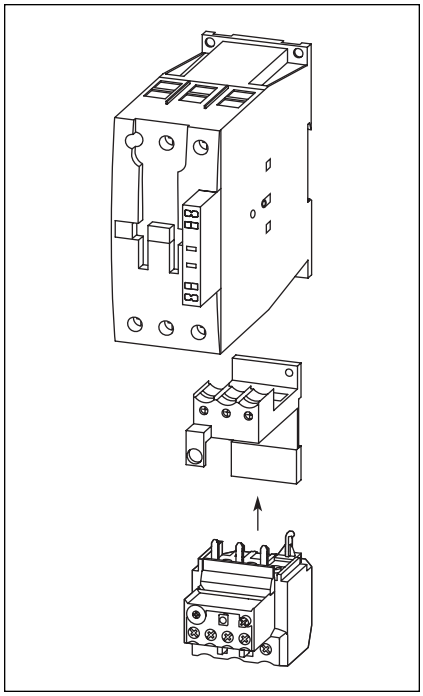


Figure 33. Frame D — Overload Mounted Separately from the Contactor

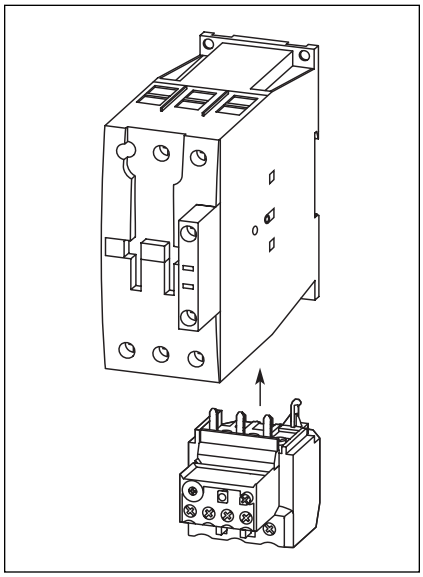


Figure 34. Frame F – G — Overload Fitted Directly to the Contactor

Accessories

Auxiliary Contacts

Front mounted snap-on auxiliary contacts for XT contactors are available with screw or spring cage terminals in a variety of contact configurations.

Table 71. Full Voltage Non-reversing 3-Pole Contactors — Contact Sequence (Circuit Symbols) — Standard Offering

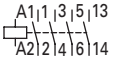
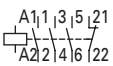
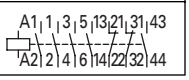
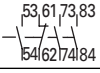
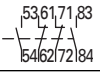
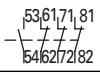
Contactor Frame	Auxiliary Contacts	Contact Sequence
B – C	1NO	
B – C	1NC	
D – G	—	
L – R	2NO-2NC	

Table 72. Front Mount Auxiliary Contacts

	Conventional Free Air Thermal Current, Ith = Ie, AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number	Price ①
Frames B – C								
	10	2	1NO-1NC		5	**XTCEXFDC11**	**XTCEXFDCC11**	
	10	2	2NC		5	**XTCEXFCC02**	**XTCEXFCCC02**	
	10	4	2NO-2NC		5	**XTCEXFCC22**	**XTCEXFCCC22**	
	10	2	2NO		5	**XTCEXFAC20**	**XTCEXFACC20**	
	10	2	1NO-1NC		5	**XTCEXFAC11**	**XTCEXFACC11**	
	10	2	2NC		5	**XTCEXFAC02**	**XTCEXFACC02**	
	10	2	1NO-1NC		5	**XTCEXFALC11** ②	**XTCEXFALCC11** ②	
	10	4	4NO		5	**XTCEXFAC40**	**XTCEXFACC40**	
	10	4	3NO-1NC		5	**XTCEXFAC31**	**XTCEXFACC31**	
	10	4	2NO-2NC		5	**XTCEXFAC22**	**XTCEXFACC22**	
	10	4	1NO-3NC		5	**XTCEXFAC13**	**XTCEXFACC13**	
	10	4	4NC		5	**XTCEXFAC04**	**XTCEXFACC04**	
	10	4	2NO-2NC		5	**XTCEXFCLC22** ②	**XTCEXFCLCC22** ②	

① Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.
② 1 early-make contact, 1 late-break contact.

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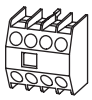
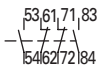
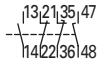
Table 72. Front Mount Auxiliary Contacts (Continued)

	Conventional Free Air Thermal Current, Ith = Ie, AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number	Price ①
Frame D – G								
	10	2	2NO		5	**XTCEXFBG20**	—	
	10	2	1NO-1NC		5	**XTCEXFAG11**	—	
	10	2	1NO-1NC		5	**XTCEXFBG11**	—	
	10	2	2NC		5	**XTCEXFBG02**	—	
	10	4	4NO-0NC		5	**XTCEXFBG40**	**XTCEXFBGC40**	
	10	4	3NO-1NC		5	**XTCEXFBG31**	**XTCEXFBGC31**	
	10	4	2NO-2NC		5	**XTCEXFBG22**	**XTCEXFBGC32**	
	10	4	2NO-2NC		5	**XTCEXFAG22**	**XTCEXFAGC22**	
	10	4	1NO-3NC		5	**XTCEXFBG13**	**XTCEXFBGC13**	
	10	4	0NO-4NC		5	**XTCEXFBG04**	**XTCEXFBGC04**	
	10	4	2NO-2NC		5	**XTCEXFBLG22** ②	**XTCEXFBLGC22** ②	

① Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.
② 1 early-make contact, 1 late-break contact.

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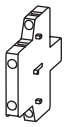
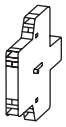
Table 73. Side Mount Auxiliary Contacts for Frame D – R, 40 – 2000A

	Conventional Free Air Thermal Current, $I_{th} = I_e$, AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Catalog Number	Price
Screw Terminals							
	10	2	1NO-1NC		1	**XTCEXSBN11**	
	10	2	1NO-1NC		1	**XTCEXSBLN11**	
	10	2	1NO-1NC		1	**XTCEXSCN11**	
Spring Cage Terminals							
	10	2	1NO-1NC		1	**XTCEXSBNC11**	
	10	2	1NO-1NC		1	**XTCEXSCNC11**	

RC Suppressor ①②

Contact Sequence

Table 74. RC Suppressor

Voltage	For use with …	Pkg. Qty.	Catalog Number	Price ③
24 – 48	XTCE007B – XTCE015B, XTCF020B	10	**XTCEXRSBW**	
48 – 130		10	**XTCEXRSBA**	
110 – 240		10	**XTCEXRSBB**	
240 – 500		10	**XTCEXRSBC**	
24 – 48	XTCE018C – XTCE032C	10	**XTCEXRSCW**	
110 – 130		10	**XTCEXRSCA**	
130 – 240		10	**XTCEXRSCB**	
240 – 500		10	**XTCEXRSCC**	
42 – 50, 48/60	XTCE040D – XTCE095F	10	**XTCEXRSFW**	
110 – 130		10	**XTCEXRSFA**	
130 – 240		10	**XTCEXRSFB**	
240 – 500		10	**XTCEXRSFC**	

① Note drop-out delay.
② For AC operated contactors, 50/60 Hz. DC operated contactors have an integrated suppressor.
③ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Varistor Suppressor ④⑤

Contact Sequence

Table 75. Varistor Suppressor

Voltage	For use with …	Pkg. Qty.	Catalog Number	Price ⑥
24 – 48	XTCE007B – XTCE015B, XTCF020B	10	**XTCEXVSBW**	
48 – 130		10	**XTCEXVSBA**	
130 – 240		10	**XTCEXVSBB**	
240 – 500		10	**XTCEXVSBC**	
24 – 48	XTCE018C – XTCE032C	10	**XTCEXVSCW**	
48 – 130		10	**XTCEXVSCA**	
130 – 240		10	**XTCEXVSCB**	
240 – 500		10	**XTCEXVSCC**	
24 – 48	XTCE040D – XTCE095F	10	**XTCEXVSFW**	
48 – 130		10	**XTCEXVSFA**	
130 – 240		10	**XTCEXVSFB**	
240 – 500		10	**XTCEXVSFC**	

④ Note drop-out delay.
⑤ For AC operated contactors, 50/60 Hz. DC operated contactors have an integrated suppressor.
⑥ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

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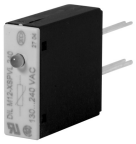
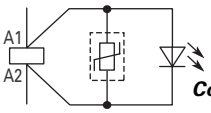
Varistor Suppressor with Integrated LED ①②





Contact Sequence

Table 76. Varistor Suppressor

Voltage	For use with …	Pkg. Qty.	Catalog Number	Price ③
24 – 48	XTCE007B – XTCE015B	10	**XTCEXVSLBW**	
130 – 240		10	**XTCEXVSLBB**	
24 – 48	XTCE018C – XTCE032C	10	**XTCEXVSLCW**	
130 – 240		10	**XTCEXVSLCB**	
42 (50 Hz), 48 (60 Hz)	XTCE040D – XTCE095F	10	**XTCEXVSLFW**	
130 – 240		10	**XTCEXVSLFB**	

① Note drop-out delay.
② For AC operated contactors, 50/60 Hz. DC operated contactors have an integrated suppressor.
③ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Voltage Indicator

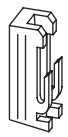
Table 77. Voltage Indicator

Voltage	For use with …	Pkg. Qty.	Catalog Number	Price ④
24 – 48	XTCE007B – XTCE015B, XTCF020B	10	**XTCEXVIBW**	
110 – 120		10	**XTCEXVIBA**	
110 – 250		10	**XTCEXVIBB**	
24 – 48	XTCE018C – XTCE032C	10	**XTCEXVICW**	
110 – 130		10	**XTCEXVICA**	
130 – 250		10	**XTCEXVICB**	
42 – 48 50/60 Hz	XTCE040D – XTCE150G	10	**XTCEXVIGW**	
48 – 130		10	**XTCEXVIGA**	
130 – 250		10	**XTCEXVIGB**	

④ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Connector ⑤

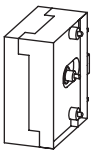
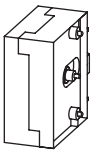
Table 78. Connector

	For use with …	Pkg. Qty.	Catalog Number	Price ⑥
	XTAE007B – XTAE032C	50	**XTCEXCNC**	
	XTAE040D – XTAE015G	50	**XTCEXCNG**	

⑤ For mechanically arranging contactors in combinations. Distance between contactors is 0 mm.
⑥ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Mechanical Interlock ⑦

Table 79. Mechanical Interlock

	For use with …	Pkg. Qty.	Catalog Number	Price ⑧
	XTCE007B – XTCE015B, XTCF020B	5	**XTCEXMLB**	
	XTCE018C – XTCE032C	1	**XTCEXMLC**	
	XTCE040D – XTCE065D	1	**XTCEXMLD**	
	XTAE080F – XTCE150G	1	**XTCEXMLG**	
	XTCE185L – XTCE500M	1	**XTCEXMLM**	
	XTCE580N – XTCEC10N	1	**XTCEXMLN**	

⑦ For two contactors with AC or DC operated magnet system which are horizontally or vertically mounted. For B – G Frames, mechanical lifespan is 2.5 x 10^6 operations and the distance between contactors is 0 mm. For L – N frames mechanical lifespan is 5 x 10^6 operations and no auxiliary contact can be mounted between the mechanical interlock and the contactor. The distance between contactors is 15 mm. XTCEXMLN consists of an interlock element and mounting plate.
⑧ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Interlocking Bridge

Table 80. Interlocking Bridge

For use with …	Pkg. Qty.	Catalog Number	Price ⑨
XTCE007B – XTCE015B	20	**XTCEXLBB**	

⑨ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Paralleling Bridge

Table 81. Paralleling Bridge

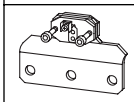
For use with …	Pkg. Qty.	Catalog Number	Price ⑩
XTCE007B – XTCE015B	20	**XTCEXPBB**	
XTCE018C – XTCE032C	20	**XTCEXPBC**	

⑩ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Discount Symbol **MC7**

Parallel Link ①②③

Table 82. Parallel Link

	For use with …	Pkg. Qty.	Catalog Number	Price ④
	XTCE007B – XTCE015B	5	**XTCEXPLKB**	
	XTCE018C – XTCE032C	5	**XTCEXPLKC**	
	XTCE040D – XTCE065D	1	**XTCEXPLKD**	
	XTCE080F – XTCE150G	1	**XTCEXPLKG**	
	XTCE185L	1	**XTCEXPLKL185**	

① 4th Pole can be broken off: 4-Pole: I_{th} = 60A; 3-Pole: I_{th} = 50A.

② AC-1 current carrying capacity of the contactor increases by a factor of 2.5. For XTCEXPLKL185, one shroud is included for protection against accidental contact

③ Protected against accidental contact in accordance with IEC 536.

④ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

3-Phase Commoning Link

Table 83. 3-Phase Commoning Link

	For use with …	Qty. Con.	Pkg. Qty.	Catalog Number	Price ⑤
Frame B					
	B-Frame XTCE Contactors	3	5	**XTCEXCLK3B**	
		4	5	**XTCEXCLK4B**	
		5	5	**XTCEXCLK5B**	

⑤ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Star-Delta (Wye Delta) Bridge

Table 84. Star-Delta (Wye Delta) Bridge

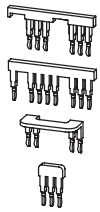
	For use with …	Pkg. Qty.	Catalog Number	Price ⑥
	XTCE007B – XTCE015B	20	**XTCEXSDBB**	
	XTCE018C – XTCE032C	20	**XTCEXSDBC**	
	XTCE040D – XTCE065D	10	**XTCEXSDBD**	
	XTCE080F — XTCE150G	1	**XTCEXSDBG**	
	XTCE185L – XTCE400M	1	**XTCEXSDB400**	
	XTCE500M	1	**XTCEXSDB500**	

⑥ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Star-Delta (Wye Delta) Link Kits ⑦

Main current wiring for star-delta (wye-delta) combinations. Includes the Star-Delta bridge.

Table 85. Star-Delta (Wye Delta) Link Kits

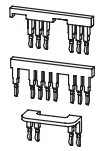
	For use with …	Pkg. Qty.	Catalog Number	Price
	XTCE007B – XTCE015B	1	**XTCEXSDLB**	
	XTCE018C – XTCE032C	1	**XTCEXSDLC**	

⑦ The following control cables are integrated in addition to the electrical interlock:
K3M: A1 – K5M: 21
K3M: 21 – K5M: A1
K3M: A2 – K5M: A2

Reversing Link Kit ⑧

Main current wiring for reversing contactors and starters.

Table 86. Reversing Link Kit

	For use with …	Pkg. Qty.	Catalog Number	Price
	XTCE007B – XTCE012B	1	**XTCEXRLB**	
	XTCE018C – XTCE032C	1	**XTCEXRLC**	

⑧ The following control cables are integrated in addition to the electrical interlock:
K1M: A1 – K2M: 21
K1M: 21 – K2M: A1
K1M: A2 – K2M: A2

Note: Reversing Link Kits do not include mechanical interlocks, see **Page 50**.

Reversing Bridge

Table 87. Reversing Bridge

For use with …	Pkg. Qty.	Catalog Number	Price ⑨
XTCE007B – XTCE105B	20	**XTCEXRBB**	
XTCE018C – XTCE032C	20	**XTCEXRBC**	

⑨ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Discount Symbol **MC7**

Incoming Terminal

Table 88. Incoming Terminal

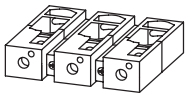
For use with …	Pkg. Qty.	Catalog Number	Price ①
XTCE007B – XTCE015B	5	**XTCEXITB**	

① Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Terminal Lug Assembly

For connection of: round conductor, flexible and stranded, flat strip conductor. With control circuit terminal.

Table 89. Terminal Lug Assembly

	For use with …	Pkg. Qty.	Catalog Number	Price
	XTCE185L – XTCE225L	1	**XTCEXTLA225**	
	XTCE250L – XTCE400M	1	**XTCEXTLA400**	

Set of (3) Lugs

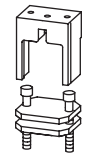
Table 90. Set of (3) Lugs

For use with …	Description	Pkg. Qty.	Catalog Number	Price
XTCE500M	Set of 3 Lugs #4-500MCM 2-Phase Cu/Al 500A	1	**XTCEXTL500**	
XTCE650N	Set of 3 Lugs #2-500MCM 2-Phase Cu/Al 650A	1	**XTCEXTL650**	
XTCE820N	Set of 3 Lugs #2-500MCM 4-Phase Cu/Al 820A	1	**XTCEXTL820**	

Terminal Flat Bar

For connection of a flat strip conductor. Comes with control circuit terminal (Consisting of 3 flat strip conductor terminals).

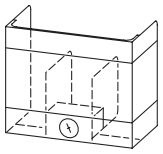
Table 91. Terminal Flat Bar

	For use with …	Pkg. Qty.	Catalog Number	Price
	XTCE500M – XTCE650N	1	**XTCEXTFB650**	
	XTCE750N – XTCE820N	1	**XTCEXTFB820**	

Terminal Shrouds

Protection against direct contact with connection lugs when touched vertically from the front.

Table 92. Terminal Shrouds

	For use with …	Pkg. Qty.	Catalog Number	Price
	XTCE185L – XTCE400M	1	**XTCEXTS400**	
	XTCE500M	1	**XTCEXTS500**	
	XTCE580N – XTCE650N	1	**XTCEXTS650**	
	XTCE750N – XTCEC10N	1	**XTCEXTS820**	

Control Wire Terminal Extension

Table 93. Control Wire Terminal Extension

For use with …	Pkg. Qty.	Catalog Number	Price ②
XTCE080F – XTCE150G	10	**XTCEXTCWG**	

② Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Discount Symbol **MC7**

Renewal Parts

Table 94. Replacement Coils

Voltage	Coil Suffix	Catalog Number	Price
Frame C			
110/50 120/60	**A**	**XTCERENCOILCA**	
110 – 130V DC	**AD**	**XTCERENCOILCAD**	
220/50 240/60	**B**	**XTCERENCOILCB**	
200 – 240V DC	**BD**	**XTCERENCOILCBD**	
415/50 480/60	**C**	**XTCERENCOILCC**	
550/50 600/60	**D**	**XTCERENCOILCD**	
208/60	**E**	**XTCERENCOILCE**	
230/50	**F**	**XTCERENCOILCF**	
190/50 220/60	**G**	**XTCERENCOILCG**	
240/50 277/60	**H**	**XTCERENCOILCH**	
380/50 440/60	**L**	**XTCERENCOILCL**	
400/50	**N**	**XTCERENCOILCN**	
380/60	**P**	**XTCERENCOILCP**	
12/50 12/60	**R**	**XTCERENCOILCR**	
12 – 14V DC	**RD**	**XTCERENCOILCRD**	
24/50 24/60	**T**	**XTCERENCOILCT**	
24 – 27V DC	**TD**	**XTCERENCOILCTD**	
24/50	**U**	**XTCERENCOILCU**	
42/50 48/60	**W**	**XTCERENCOILCW**	
48 – 60V DC	**WD**	**XTCERENCOILCWD**	
48/50	**Y**	**XTCERENCOILCY**	
Frame D			
110/50 120/60	**A**	**XTCERENCOILDA**	
110 – 130V DC	**AD**	**XTCERENCOILDAD**	
220/50 240/60	**B**	**XTCERENCOILDB**	
200 – 240V DC	**BD**	**XTCERENCOILDBD**	
415/50 480/60	**C**	**XTCERENCOILDC**	
550/50 600/60	**D**	**XTCERENCOILDD**	
208/60	**E**	**XTCERENCOILDE**	
230/50	**F**	**XTCERENCOILDF**	
190/50 220/60	**G**	**XTCERENCOILDG**	
240/50 277/60	**H**	**XTCERENCOILDH**	
380/50 440/60	**L**	**XTCERENCOILDL**	
400/50	**N**	**XTCERENCOILDN**	
380/60	**P**	**XTCERENCOILDP**	
12/50 12/60	**R**	**XTCERENCOILDR**	
12 – 14V DC	**RD**	**XTCERENCOILDRD**	
24/50 24/60	**T**	**XTCERENCOILDT**	
24 – 27V DC	**TD**	**XTCERENCOILDTD**	
24/50	**U**	**XTCERENCOILDU**	
42/50 48/60	**W**	**XTCERENCOILDW**	
48 – 60V DC	**WD**	**XTCERENCOILDWD**	
48/50	**Y**	**XTCERENCOILDY**	
Frame F			
110/50 120/60	**A**	**XTCERENCOILFA**	
110 – 130V DC	**AD**	**XTCERENCOILFAD**	
220/50 240/60	**B**	**XTCERENCOILFB**	
200 – 240V DC	**BD**	**XTCERENCOILFBD**	
415/50 480/60	**C**	**XTCERENCOILFC**	
550/50 600/60	**D**	**XTCERENCOILFD**	
208/60	**E**	**XTCERENCOILFE**	
230/50	**F**	**XTCERENCOILFF**	
190/50 220/60	**G**	**XTCERENCOILFG**	
240/50 277/60	**H**	**XTCERENCOILFH**	
380/50 440/60	**L**	**XTCERENCOILFL**	
400/50	**N**	**XTCERENCOILFN**	
380/60	**P**	**XTCERENCOILFP**	
12/50 12/60	**R**	**XTCERENCOILFR**	
24/50 24/60	**T**	**XTCERENCOILFT**	
24 – 27V DC	**TD**	**XTCERENCOILFTD**	
24/50	**U**	**XTCERENCOILFU**	
42/50 48/60	**W**	**XTCERENCOILFW**	
48 – 60V DC	**WD**	**XTCERENCOILFWD**	
48/50	**Y**	**XTCERENCOILFY**	

Voltage	Coil Suffix	Catalog Number	Price
Frame G			
100 – 120V 50/60	**A**	**XTCERENCOILGA**	
110 – 130V DC	**AD**	**XTCERENCOILGAD**	
190 – 240V 50/60	**B**	**XTCERENCOILGB**	
200 – 240V DC	**BD**	**XTCERENCOILGBD**	
480 – 500V 50/60	**C**	**XTCERENCOILGC**	
380 – 440V 50/60	**L**	**XTCERENCOILGL**	
24/50 24/60	**T**	**XTCERENCOILGT**	
24 – 27V DC	**TD**	**XTCERENCOILGTD**	
42 – 48V 50/60	**W**	**XTCERENCOILGW**	
48 – 60V DC	**WD**	**XTCERENCOILGWD**	
Frame L ①			
110 – 250V AC/DC	**A**	**XTCERENCOILLA**	
250 – 500V 40 – 60	**C**	**XTCERENCOILLC**	
24 – 48V DC	**TD**	**XTCERENCOILLTD**	
48 – 110V AC/DC	**Y**	**XTCERENCOILLY**	
Frame M ①			
110 – 250V AC/DC	**A**	**XTCERENCOILMA**	
250 – 500V 40 – 60	**C**	**XTCERENCOILMC**	
24 – 48V DC	**TD**	**XTCERENCOILMTD**	
48 – 110V AC/DC	**Y**	**XTCERENCOILMY**	
Frame N ①			
110 – 250V AC/DC	**A**	**XTCERENCOILNA**	
250 – 500V 40 – 60	**C**	**XTCERENCOILNC**	
48 – 110V AC/DC	**Y**	**XTCERENCOILNY**	

① Electronic modules including coils.

Table 95. Replacement Contact Kits

For use with …	Catalog Number	Price
XTAE040D – XTAE065D	**XTCERENCONTACTD**	
XTCE185L – XTCE250L	**XTCERENCONTACTL**	
XTCE300M – XTCE500M	**XTCERENCONTACTM**	

Table 96. Replacement Vacuum Tube Assembly

For use with …	Catalog Number	Price
XTCE580N	**XTCERENVACT580**	
XTCE650N	**XTCERENVACT650**	
XTCE750N	**XTCERENVACT750**	
XTCE820N	**XTCERENVACT820**	

Table 97. Replacement Arc Chambers

For use with …	Catalog Number	Price
XTCE185L	**XTCERENARC185**	
XTCE225L	**XTCERENARC225**	
XTCE250L	**XTCERENARC250**	
XTCE300M	**XTCERENARC300**	
XTCE400M	**XTCERENARC400**	
XTCE500M	**XTCERENARC500**	

Discount Symbol **MC17**

Technical Data and Specifications

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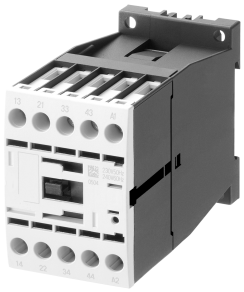


Frame B XTCE Contactor

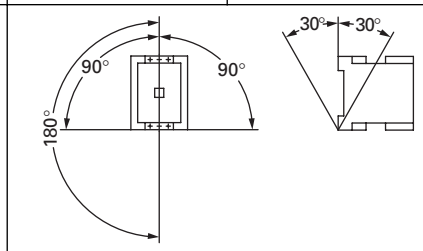
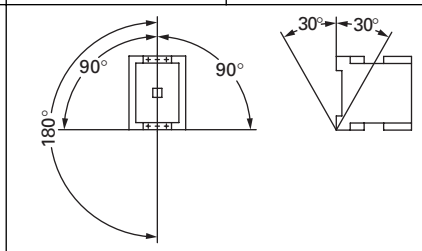
XT Contactors

Frame B

Table 98. XT Contactors Technical Data and Specifications — Frame B

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B
General				
Standards	IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS			
Weights in kg [Lb] AC operated DC operated	 0.23 [0.51] 0.28 [0.62]	 0.23 [0.51] 0.28 [0.62]	 0.23 [0.51] 0.28 [0.62]	 0.23 [0.51] 0.28 [0.62]
Mechanical Life	10,000,000	10,000,000	10,000,000	10,000,000
Mechanical Operating Frequency (ops/hr) AC operated DC operated	 9000 9000	 9000 9000	 9000 9000	 9000 9000
Maximum Operating Frequency (ops/hr)				
Mechanical Operating Frequency (ops/hr) AC-1; 400V I_e AC-3; 400V I_e AC-4; 400V I_e	 800 1000 300	 800 1000 300	 800 1000 300	 800 1000 300
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30			
Insulation Voltage (U_i) VAC	690	690	690	690
Impulse Withstand Voltage (U_{imp}) VAC	8000	8000	8000	8000
Operational Voltage (U_e) VAC	690	690	690	690
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between coil and contacts (VAC) Between contacts (VAC)	 400 400	 400 400	 400 400	 400 400
Making Capacity (Amps)	108	108	144	155
Breaking Capacity (Amps) 220/230V 380/400V 500V 660/690V	 70 70 50 40	 90 90 70 50	 120 120 100 70	 124 124 100 70
Short-Circuit Protection Rating Maximum Fuse Type 2 Coordination 400V; gG/gL 500V 690V; gG/gL 690V Type 1 Coordination 400V; gG/gL 500V 690V; gG/gL 690V	 20 16 35 20	 20 16 35 20	 20 20 35 20	 20 20 63 50
Degree of Protection	IP20			
Protection against Direct Contact when Actuated from Front (IEC 536)	Finger- and back-of-hand proof			

Table 98. XT Contactors Technical Data and Specifications — Frame B (Continued)

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B
General (Continued)				
Main Cable Cross-Section Solid (mm^2)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	18 – 14
Main Cable Connection Screw/Bolt Tightening torque Nm Lb-in	 M3.5 1.2 10.6	 M3.5 1.2 10.6	 M3.5 1.2 10.6	 M3.5 1.2 10.6
Control Circuit Cable Cross-Sections Solid (mm^2)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	18 – 14
Main Cable Connection Screw/Bolt Tightening torque Nm Lb-in	 M3.5 1.2 10.6	 M3.5 1.2 10.6	 M3.5 1.2 10.6	 M3.5 1.2 10.6
Tools Pozidrive screwdriver Standard screwdriver	 Size 2 0.8 x 5.5	 Size 2 0.8 x 5.5	 Size 2 0.8 x 5.5	 Size 2 0.8 x 5.5
Mounting Position, AC and DC Operated				
Ambient Temperature	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]
Ambient Storage Temperature	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]
Environmental				
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 mS Main contact — NO Contact Auxiliary contact — NO Contact Auxiliary contact — NC Contact	 10g 7g 5g	 10g 7g 5g	 10g 7g 5g	 10g 7g 5g
Overvoltage Category/Pollution degree	III/3	III/3	III/3	III/3

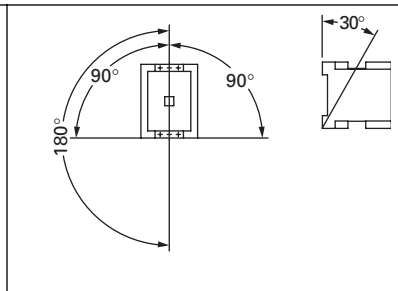
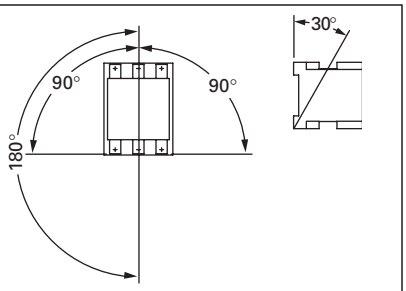
① Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated.

Frame C – D

Table 99. XT Contactors Technical Data and Specifications — Frame C – D

Description	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
General						
Standards	IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS					
Weights in kg [Lb]						
AC operated	0.42 [0.93]	0.42 [0.93]	0.42 [0.93]	0.9 [2.0]	0.9 [2.0]	0.9 [2.0]
DC operated	0.48 [1.06]	0.48 [1.06]	0.48 [1.06]	1.1 [2.4]	1.1 [2.4]	1.1 [2.4]
Mechanical Life	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Mechanical Operating Frequency (ops/hr)						
AC operated	5000	5000	5000	5000	5000	5000
DC operated	5000	5000	5000	5000	5000	5000
Mechanical Operating Frequency (ops/hr)						
AC-1; 400V I_e	800	800	800	800	800	800
AC-3; 400V I_e	800	800	800	800	800	800
AC-4; 400V I_e	300	300	300	300	300	300
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30					
Insulation Voltage (U_i) VAC	690	690	690	690	690	690
Impulse Withstand Voltage (U_{imp}) VAC	8000	8000	8000	8000	8000	8000
Operating Voltage (U_e) VAC	690	690	690	690	690	690
Safe Isolation to VDE 0106 Part 101 and Part 101/A1						
Between coil and contacts (VAC)	440	440	440	440	440	440
Between contacts (VAC)	238	440	440	440	440	440
Making Capacity (Amps)	238	350	384	560	700	910
Breaking Capacity (Amps)						
220/230V	170	250	320	400	500	650
380/400V	170	250	250	400	500	650
500V	170	250	250	400	500	650
660/690V	120	150	150	250	320	370
Short-Circuit Protection Rating Maximum Fuse						
Type 2 Coordination						
400V; gG/gL 500V	25	35	63	63	80	125
690V; gG/gL 690V	25	35	35	50	63	80
Type 1 Coordination						
400V; gG/gL 500V	63	100	125	125	160	250
690V; gG/gL 690V	50	50	63	80	80	100
Degree of Protection	IP00					
Protection against Direct Contact when Actuated from Front (IEC 536)	Finger- and back-of-hand proof					
Main Cable Cross-Section						
Solid (mm^2)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)
Flexible with ferrule (mm^2)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)
Solid or Stranded (AWG)	18 – 6	18 – 6	18 – 6	18 – 6	18 – 6	18 – 6
Flat Conductor (Number of Segments x Width x Thickness)	—	—	—	2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8)
Main Cable Connection Screw/Bolt	M5	M5	M5	M6	M6	M6
Tightening torque						
Nm	3	3	3	3	3	3
Lb-in	26.6	26.6	26.6	26.6	26.6	26.6
Control Circuit Cable Cross-Sections						
Solid (mm^2)	1 x (0.75 – 4) 1 x (0.75 – 4)	1 x (0.75 – 4) 1 x (0.75 – 4)	1 x (0.75 – 4) 1 x (0.75 – 4)	1 x (0.75 – 4) 1 x (0.75 – 4)	1 x (0.75 – 4) 1 x (0.75 – 4)	1 x (0.75 – 4) 1 x (0.75 – 4)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14
Control Circuit Cable Connection Screw/Bolt	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Tightening torque						
Nm	1.2	1.2	1.2	1.2	1.2	1.2
Lb-in	10.6	10.6	10.6	10.6	10.6	10.6
Tools						
Main and control circuit cable	Size 2	Size 2	Size 2	Size 2	Size 2	Size 2
Pozidrive screwdriver	0.8 x 5.5	0.8 x 5.5	0.8 x 5.5	0.8 x 5.5	0.8 x 5.5	0.8 x 5.5
Standard screwdriver	1 x 6	1 x 6	1 x 6	1 x 6	1 x 6	1 x 6

Table 99. XT Contactors Technical Data and Specifications — Frame C – D (Continued)

Description	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
General (Continued)						
Mounting Position, AC and DC operated						
Ambient Temperature	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]
Ambient Storage Temperature	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]
Environmental						
Mechanical Shock Resistance (IEC/EN 60068-2-27) Main contact — NO Contact Auxiliary contact — NO Contact Auxiliary contact — NC Contact	 10 7 5	 10 7 5	 10 7 5	 10 7 5	 10 7 5	 10 7 5
Overvoltage Category / Pollution Degree	III/3	III/3	III/3	III/3		

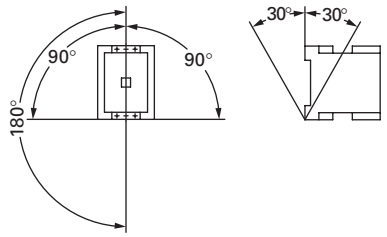
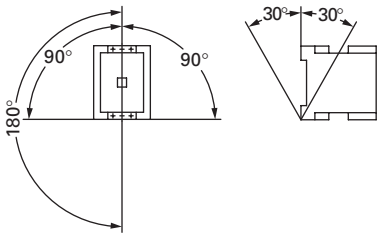
Frame F – G

Table 100. XT Contactors Technical Data and Specifications — Frame F – G

Description	XTCE080F	XTCE095F	XTCE115G	XTCE150G
General				
Standards	IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS			
Weights in kg [Lb] AC operated DC operated	 2 2.1	 2 2.1	 2 2.1	 2 2.1
Mechanical Life	10,000	10,000	10,000	10,000
Mechanical Operating Frequency (ops/hr) AC operated DC operated	 5000 1000	 5000 1000	 5000 1000	 5000 1000
Mechanical Operating Frequency (ops/hr) AC-1; 400V I_e AC-3; 400V I_e AC-4; 400V I_e	 800 800 300	 800 800 300	 800 800 300	 800 800 300
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30			
Insulation Voltage (U_i) VAC	1000	1000	1000	1000
Impulse Withstand Voltage (U_{imp}) VAC	8000	8000	8000	8000
Operational Voltage (U_e) VAC	1000	1000	1000	1000
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between coil and contacts (VAC) Between contacts (VAC)	 440 440	 440 440	 440 440	 440 440
Making Capacity (Amps)	1120	1330	1610	2100
Breaking Capacity (Amps) 220/230V 380/400V 500V 660/690V 1000V	 800 800 800 650 320	 950 950 950 800 370	 1150 1150 1150 1100 450	 1500 1500 1500 1320 550
Short-Circuit Protection Rating Maximum Fuse Type 2 Coordination 400V; gG/gL 500V 690V; gG/gL 690V Type 1 Coordination 400V; gG/gL 500V 690V; gG/gL 690V	①	①	①	①
Degree of Protection	IP00			
Protection Against Direct Contact when Actuated from Front (IEC 536)	Finger- and back-of-hand proof			

① Contact Eaton.

Table 100. XT Contactors Technical Data and Specifications — Frame F – G (Continued)

Description	XTCE080F	XTCE095F	XTCE115G	XTCE150G
General (Continued)				
Main Cable Cross-Section Solid (mm^2)	—	—	—	—
Flexible with ferrule (mm^2)	1 x (4 – 70) 2 x (4 – 50)	1 x (4 – 70) 2 x (4 – 50)	1 x (10 – 95) 2 x (10 – 70)	1 x (10 – 95) 2 x (10 – 70)
Stranded (mm^2)	1 x (16 – 95) 2 x (16 – 70)	1 x (16 – 95) 2 x (16 – 70)	1 x (16 – 120) 2 x (16 – 95)	1 x (16 – 120) 2 x (16 – 95)
Solid or Stranded (AWG)	10 – 4/0	10 – 4/0	8 – 250 MCM	8 – 250 MCM
Flat Conductor (Number of Segments x Width x Thickness)	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)
Main Cable Connection Screw/Bolt Tightening torque Nm Lb-in	 M10 10 88.5	 M10 10 88.5	 M10 10 88.5	 M10 10 88.5
Control Circuit Cable Cross-Sections Solid (mm^2)	 1 x (0.75 – 4) 1 x (0.75 – 4)	 1 x (0.75 – 4) 1 x (0.75 – 4)	 1 x (0.75 – 4) 1 x (0.75 – 4)	 1 x (0.75 – 4) 1 x (0.75 – 4)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	18 – 14
Control Circuit Cable Connection Screw/Bolt Tightening torque Nm Lb-in	 M3.5 1.2 10.6	 M3.5 1.2 10.6	 M3.5 1.2 10.6	 M3.5 1.2 10.6
Tools Main and control circuit cable Pozidrive screwdriver Standard screwdriver	 Size 2 0.6 x 3.5	 Size 2 0.6 x 3.5	 Size 2 0.6 x 3.5	 Size 2 0.6 x 3.5
Mounting Position, AC and DC operated				
Ambient Temperature	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]
Ambient Storage Temperature	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]
Environmental				
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 mS Main contact — NO Contact Auxiliary contact — NO Contact Auxiliary contact — NC Contact	 10g 7g 5g	 10g 7g 5g	 10g 7g 5g	 10g 7g 5g
Overvoltage Category/Pollution Degree	III/3	III/3	III/3	III/3

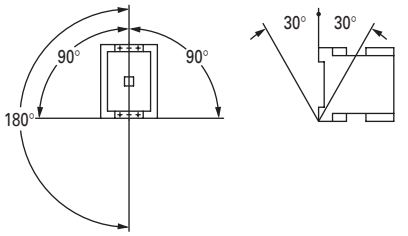
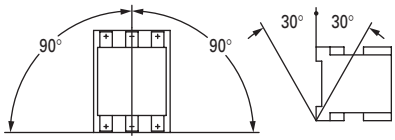
Frame L – M

Table 101. XT Contactors Technical Data and Specifications — Frame L – M

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M
General						
Standards	IEC/EN 60947, VDE 0660, UL, CSA					
Weights in kg [Lb]	6.5 [14.3]	6.5 [14.3]	6.5 [14.3]	8 [18]	8 [18]	8 [18]
Mechanical Life	10,000,000	10,000,000	10,000,000	7000000	7000000	7000000
Mechanical Operating Frequency (ops/hr)						
AC operated	3000	3000	3000	2000	2000	2000
DC operated	3000	3000	3000	2000	2000	2000
Mechanical Operating Frequency (ops/hr)	See **Figure 35** on **Page 62**.					
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30					
Insulation Voltage (U_i) VAC	1000	1000	1000	1000	1000	1000
Impulse Withstand Voltage (U_{imp}) VAC	8000	8000	8000	8000	8000	8000
Operating Voltage (U_e) VAC	1000	1000	1000	1000	1000	1000
Safe Isolation to VDE 0106 Part 101 and Part 101/A1						
Between coil and contacts (VAC)	500	500	500	500	500	500
Between contacts (VAC)	500	500	500	500	500	500
Making Capacity (Amps)	3000	3000	3000	5500	5500	5500
Breaking Capacity (Amps)						
220/230V	2500	2500	2500	5000	5000	5000
380/400V	2500	2500	2500	5000	5000	5000
500V	2500	2500	2500	5000	5000	5000
660/690V	2500	2500	2500	5000	5000	5000
1000V	760	760	760	950	950	950
Short-Circuit Protection Rating Maximum Fuse						
Type 2 Coordination						
400V; gG/gL 500V	315	315	315	500	500	500
690V; gG/gL 690V	315	315	315	500	500	500
1000V; gG/gL 1000V	160	160	160	200	200	200
Type 1 Coordination						
400V; gG/gL 500V	400	400	400	630	630	630
690V; gG/gL 690V	400	400	400	630	630	630
1000V; gG/gL 1000V	200	200	200	250	250	250
Degree of Protection	IP00					
Protection Against Direct Contact when Actuated from Front (Iec 536)	Finger- and back-of-hand proof with terminal shroud or terminal block.					
Main Cable Cross-Section						
Flexible with cable lug (mm^2)	35 – 95	50 – 240	50 – 240	50 – 240	50 – 240	50 – 240
Stranded with cable lug (mm^2)	50 – 120	70 – 240	70 – 240	70 – 240	70 – 240	70 – 240
Solid or Stranded (AWG)		1/0 – 250 MCM ①	1/0 – 250 MCM ①	1/0 – 250 MCM ①	1/0 – 250 MCM ①	1/0 – 250 MCM ①
Flat Conductor (mm)						
Busbar — Width in mm	20	20	25	25	25	30
Main Cable Connection Screw/Bolt	M10	M10	M10	M10	M10	M10
Tightening torque						
Nm	24	24	24	24	24	24
Lb-in	213	213	213	213	213	213
Control Circuit Cable Cross-Sections						
Solid (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or Stranded (AWG)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)
Control Circuit Cable Connection Screw/Bolt	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Tightening torque						
Nm	1.2	1.2	1.2	1.2	1.2	1.2
Lb-in	10.6	10.6	10.6	10.6	10.6	10.6
Tools						
Main cable wrench	16 mm	16 mm	16 mm	16 mm	16 mm	16 mm
Control circuit cable pozidrive screwdriver	Size 2	Size 2	Size 2	Size 2	Size 2	Size 2

① Screw tightening with flat cable terminal or cable terminal blocks. See terminal capacity for cable terminal blocks.

Table 101. XT Contactors Technical Data and Specifications — Frame L – M (Continued)

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M
General (Continued)						
Mounting Position, AC and DC Operated						
Ambient Temperature	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]
Ambient Storage Temperature	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]
Environmental						
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 mS						
Main contact — NO Contact	10g	10g	10g	10g	10g	10g
Auxiliary contact — NO Contact	10g	10g	10g	10g	10g	10g
Auxiliary contact — NC Contact	8g	8g	8g	8g	8g	8g
Overvoltage Category/ Pollution Degree	III/3	III/3	III/3	III/3	III/3	III/3
Switching Capacity, kvar ① Individual Compensation						
230V	87	—	—	115	—	—
400/420/440V	150	—	—	200	—	—
525V	190	—	—	265	—	—
690V	150	—	—	200	—	—
Group Compensation, with Choke						
230V	80	100	110	130	160	160
400/420/440V	150	175	190	225	280	280
525V	200	230	260	290	370	370
690V	260	300	340	390	480	480
Group Compensation, without Choke						
230V	66	—	—	85	—	—
400/420/440V	115	—	—	150	—	—
525V	145	—	—	195	—	—
690V	115	—	—	150	—	—

① When using contactors for group compensation, a minimum inductance of approx. 6 uh per capacitor must be available to limit the high inrush current peaks. This corresponds to an air-cored coil with 5 windings and a coil diameter of approximately 140 mm. The conductor cross-section must be selected according to the rated current per phase.

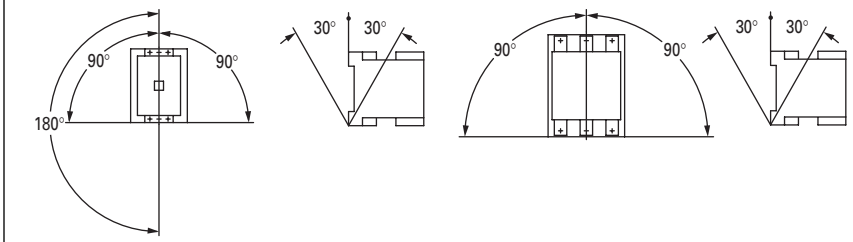
Frame N – R

Table 102. XT Contactors Technical Data and Specifications — Frame N – R

Description	XTCE580N	XTCE650N	XTCE750N, XTCE820N,	XTCEC10N	XTCEC14P, XTCEC20R
General					
Standards	IEC/EN 60947, VDE 0660, UL, CSA				
Weights in kg [Lb]	15 [33]	15 [33]	15 [33]	15 [33]	15, 32 [33, 70]
Mechanical Life	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Mechanical Operating Frequency (ops/hr)					
AC operated	1000	1000	1000	1000	1000
DC operated	1000	1000	1000	1000	1000
Maximum Operating frequency (ops/hr)	See **Figure 35** on **Page 62**.				
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30				
Insulation Voltage (U_i) VAC	1000	1000	1000	1000	1000
Impulse Withstand Voltage (U_{imp}) VAC	8000	8000	8000	8000	8000
Operating Voltage (U_e) VAC	1000	1000	1000	1000	1000
Safe Isolation to VDE 0106 Part 101 and Part 101/A1					
Between coil and contacts (VAC)	500	500	500	500	500
Between contacts (VAC)	500	500	500	500	500
Making Capacity (Amps)	7800	7800	9840	9840	9840
Breaking Capacity (Amps)					
220/230V	6500	6500	8200	8200	8200
380/400V	6500	6500	8200	8200	8200
500V	6500	6500	8200	8200	8200
660/690V	6500	6500	8200	8200	8200
1000V	4350	4350	5800	5800	5800
Short-Circuit Protection Rating Maximum Fuse					
Type 2 Coordination					
400V; gG/gL 500V	630	630	630	630	—
690V; gG/gL 690V	630	630	630	630	—
1000V; gG/gL 1000V	500	500	630	630	—
Type 1 Coordination					
400V; gG/gL 500V	1000	1000	1200	1200	—
690V; gG/gL 690V	1000	1000	1200	1200	—
1000V; gG/gL 1000V	630	630	800	800	—
Degree of Protection	IP00				
Protection Against Direct Contact when Actuated from Front (Iec 536)	Finger- and back-of-hand proof with terminal shroud or terminal block.				
Main Cable Cross-Section					
Flexible with cable lug (mm^2)	50-240	50-240	50-240	50-240	50-240
Stranded with cable lug (mm^2)	70-240	70-240	70-240	70-240	70-240
Solid or Stranded (AWG)	2/0 – 500 MCM	2/0 – 500 MCM	2/0 – 500 MCM	2/0 – 500 MCM	2/0 – 500 MCM
Flat Conductor (mm)	①	①	①	①	①
Busbar — Width in mm	50	50	50	50	50
Main Cable Connection Screw/Bolt	M10	M10	M12	M12	M12
Tightening torque					
Nm	24	24	35	35	35
Lb-in	213	213	311	311	311
Control Circuit Cable Cross-Sections					
Solid (mm^2)	1 x (0.75 – 2.5)	1 x (0.75 – 2.5)	1 x (0.75 – 2.5)	1 x (0.75 – 2.5)	1 x (0.75 – 2.5)
	2 x (0.75 – 2.5)	2 x (0.75 – 2.5)	2 x (0.75 – 2.5)	2 x (0.75 – 2.5)	2 x (0.75 – 2.5)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5)	1 x (0.75 – 2.5)	1 x (0.75 – 2.5)	1 x (0.75 – 2.5)	1 x (0.75 – 2.5)
	2 x (0.75 – 2.5)	2 x (0.75 – 2.5)	2 x (0.75 – 2.5)	2 x (0.75 – 2.5)	2 x (0.75 – 2.5)
Solid or Stranded (AWG)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)
Control Circuit Cable Connection Screw/Bolt	M3.5	M3.5	M3.5	M3.5	M3.5
Tightening torque					
Nm	1.2	1.2	1.2	1.2	1.2
Lb-in	10.6	10.6	10.6	10.6	10.6

① Screw tightening with flat cable terminal or cable terminal blocks. See terminal capacity for cable terminal blocks.

Table 102. XT Contactors Technical Data and Specifications — Frame N – R (Continued)

Description	XTCE580N	XTCE650N	XTCE750N, XTCE820N,	XTCEC10N	XTCEC14N, XTCEC20N
General (Continued)					
Tools					
Main cable wrench	16 mm	16 mm	18 mm	18 mm	18 mm
Control circuit cable pozidrive screwdriver	Size 2	Size 2	Size 2	Size 2	Size 2
Mounting Position, AC and DC Operated					
Ambient Temperature	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]
Ambient Storage Temperature	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]
Environmental					
Mechanical Shock Resistance (IEC/EN 60068-2-27)					
Half-sinusoidal shock 10 mS (g)					
Main contact — NO Contact	10	10	10	10	10
Auxiliary contact — NO Contact	10	10	10	10	10
Auxiliary contact — NC Contact	8	8	8	8	8
Overvoltage Category/Pollution Degree	III/3	III/3	III/3	III/3	III/3
Switching Capacity, kvar ①					
Individual Compensation					
230V	175	—	—	—	—
400/420/440V	300	—	—	—	—
525V	400	—	—	—	—
690V	300	—	—	—	—

① When using contactors for group compensation, a minimum inductance of approx. 6 uh per capacitor must be available to limit the high inrush current peaks. This corresponds to an air-cored coil with 5 windings and a coil diameter of approximately 140 mm. The conductor cross-section must be selected according to the rated current per phase.

Table 103. Utilization Category ②

Type	AC-1 Characteristic	AC-3	AC-4
XTCE185L	2	1	6
XTCE225L	2	1	6
XTCE250L	2	1	6
XTCE300M	3	2	7
XTCE400M	3	2	7
XTCE500M	3	2	7
XTCE580N	3	4	5
XTCE650N	3	4	5
XTCE750N	3	4	5
XTCE820N	3	4	5

② P_N = max. motor rating (kW) of the relevant contactor.
ops./h = max. number of operations per hour.

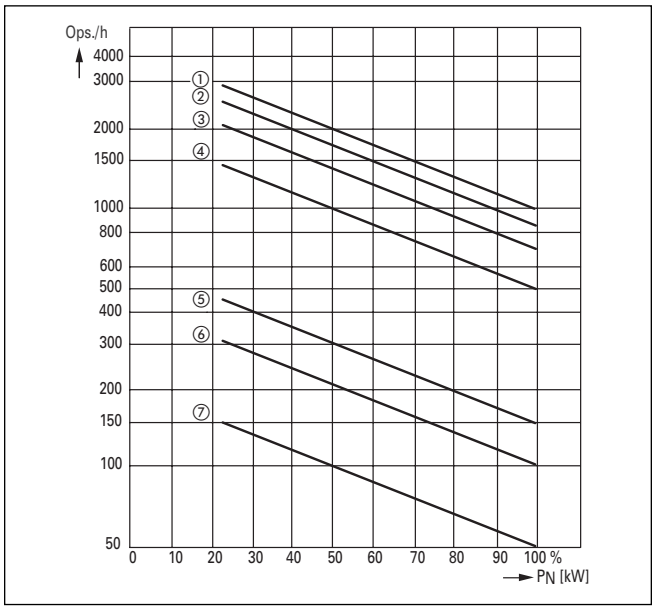


Figure 35. Maximum Operating Frequency — Related to Rating and Utilization Category (400V)

Coil Data

Frame B – D

Table 104. Coil Data — Frame B – D

	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
Voltage Tolerance										
Pick-Up (x U_C)										
AC operated	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1
DC operated	0.8 – 1.11 ①	0.8 – 1.11 ①	0.8 – 1.11 ①	0.8 – 1.11 ②	0.8 – 1.11 ②	0.8 – 1.11 ②	0.8 – 1.11 ②	0.8 – 1.11 ②	0.8 – 1.11 ②	0.8 – 1.11 ②
Drop-Out (x U_C)										
AC operated	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6
DC operated	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6
Power Consumption of the coil at cold state and 1.0 x U_C										
AC operated										
Pick-Up VA	24	24	24	24	50	50	50	130	130	130
Pick-Up W	19	19	19	19	40	40	40	80	80	80
Single-voltage coil 50 Hz										
Sealing VA	4	4	4	4	8	8	8	14	14	14
Sealing W	1.2	1.2	1.2	1.2	2.4	2.4	2.4	4	4	4
60 Hz										
Pick-Up VA	29	29	29	29	62	62	62	62	62	62
Pick-Up W	23	23	23	23	50	50	50	50	50	50
Sealing VA	4.4	4.4	4.4	4.4	9.1	9.1	9.1	9.1	9.1	9.1
Sealing W	1.3	1.3	1.3	1.3	2.7	2.7	2.7	2.7	2.7	2.7
50/60 Hz										
Pick-Up VA	28	28	28	28	60	60	60	60	60	60
	26	26	26	26	54	54	54	54	54	54
Pick-Up W	22	22	22	22	48	48	48	48	48	48
	21	21	21	21	43	43	43	43	43	43
Sealing VA	4.6	4.6	4.6	4.6	9.5	9.5	9.5	9.5	9.5	9.5
	3.9	3.9	3.9	3.9	7.9	7.9	7.9	7.9	7.9	7.9
Sealing W	1.4	1.4	1.4	1.4	2.8	2.8	2.8	2.8	2.8	2.8
	1.2	1.2	1.2	1.2	2.4	2.4	2.4	2.4	2.4	2.4
DC operated										
Pick-Up W	3	3	4.5	4.5	12 at 24V	12 at 24V	12 at 24V	12 at 24V	12 at 24V	12 at 24V
Sealing W	3	3	4.5	4.5	0.5 at 24V	0.5 at 24V	0.5 at 24V	0.5 at 24V	0.5 at 24V	0.5 at 24V
Duty Factor (%DF)	100	100	100	100	100	100	100	100	100	100
Switching Time at 100% U_C (approximate values)										
Main Contact										
AC operated										
Closing delay (mS)	<20	<20	<20	<20	<25	<25	<25	<25	<25	<25
Opening delay (mS)	<15	<15	<15	<15	<20	<20	<20	<25	<25	<25
DC operated										
Closing delay (mS)	<35	<35	<35	<35	<55	<55	<55	<60	<60	<60
Opening delay (mS)	<15	<15	<15	<15	<15	<15	<15	<20	<20	<20
Arcing time (mS)	10	10	10	10	10	10	10	10	10	10

Electromagnetic Compatibility (EMC)

Emitted interference	To EN-60947-1
Noise Immunity	To EN-60947-1

① At 24V: 0.7 – 1.3 without additional auxiliary contact modules and ambient temperature +40°C [104°F].

② Coil Suffix AD: U_{min} 110V DC/U_{max} 130V DC.
Coil Suffix BD: U_{min} 200V DC/U_{max} 240V DC.
Example:
$U_C = 0.7 \times U_{min} — 1.2 \times U_{max}$
$U_C = 0.7 \times 24V — 1.2 \times 27V$ DC

Frames F – G

Table 105. Coil Data — Frames F – G

	XTCE80F	XTCE95F	XTCE115G	XTCE150G
Voltage Tolerance				
Pick-Up (x U_C)				
AC operated	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1
DC operated	0.7 – 1.2 ①	0.7 – 1.2 ①	0.7 – 1.2 ①	0.7 – 1.2 ①
Drop-Out (x U_C)				
AC operated	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6
DC operated	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6
Power Consumption of the coil at cold state and 1.0 x U_C				
AC operated				
Pick-Up VA	310	310	130	130
Pick-Up W	165	165	130	130
Single-voltage coil 50 Hz				
Sealing VA	26	26	3.5	3.5
Sealing W	5.5	5.5	2	2
60 Hz				
Pick-Up VA	375	375	130	130
Pick-Up W	190	190	130	130
Sealing VA	31	31	3.5	3.5
Sealing W	6.8	6.8	2	2
50/60 Hz				
Pick-Up VA	375	375	130	130
Pick-Up W	190	190	130	130
Sealing VA	31	31	3.5	3.5
Sealing W	6.8	6.8	2	2
DC operated				
Pick-Up W	90 at 24V	90 at 24V	130 at 24V	130 at 24V
Sealing W	2 at 24V	2 at 24V	2 at 24V	2 at 24V
Duty Factor (%DF)	100	100	100	100
Switching Time at 100% U_C (approximate values)				
Main Contact				
AC operated				
Closing delay (mS)	Max. 25 mS	Max. 25 mS	Max. 30 mS	Max. 30 mS
Opening delay (mS)	Max. 20 mS	Max. 20 mS	Max. 40 mS	Max. 40 mS
DC operated				
Closing delay (mS)	Max. 40 mS	Max. 40 mS	Max. 35 mS	Max. 35 mS
Opening delay (mS)	Max. 40 mS	Max. 40 mS	Max. 40 mS	Max. 40 mS
Electromagnetic Compatibility (EMC)				
Emitted interference	To EN60947-1			
Noise Immunity	To EN60947-1			

① At 24V: 0.7 – 1.3 without additional auxiliary contact modules and ambient temperature +40°C [104°F].

Frames L – R

Table 106. Coil Data — Frames L – R

Description	XTCE185L	XTCE225L, XTCE250L	XTCE300M, XTCE400M	XTCE500M
Voltage Tolerance				
Pick-Up (x U_c) XTCE185L – XTCEC20R XTCS185L – XTCS500M Drop-Out (x U_c) XTCE185L – XTCEC20R XTCS185L – XTCS500M	0.7 x U_{cmin} — 1.15 x U_{cmax} 0.85 x U_{cmin} — 1.1 x U_{cmax} 0.2 x U_{cmin} — 0.6 x U_{cmax} 0.2 x U_{cmin} — 0.4 x U_{cmax}			
Power Consumption of the coil at cold state and 1.0 x U_C				
XTCE185L – XTCEC20R Pick-Up VA Pick-Up W Sealing VA Sealing W	 250 ① 200 4.3 3.3	 250 ① 200 4.3 3.3	 450 ① 350 4.3 3.3	 450 ① 350 4.3 3.3
XTCS185L – XTCS500M Pick-Up VA Pick-Up W Sealing VA Sealing W	 360 325 4.3 3.3	 360 325 4.3 3.3	 715 645 4.3 3.3	 715 645 4.3 3.3
Duty Factor (%DF)	100	100	100	100
Switching Time at 100% Main Contact U_C (approximate values)				
XTCE185L – XTCEC20R Closing delay (mS) Opening delay (mS) XTCS185L – XTCS500M Closing delay (mS) Opening delay (mS)	 <100 <80 <50 <40	 <100 <80 <50 <40	 <80 <80 <50 <40	 <80 <80 <50 <40
Reaction in Threshold and Sealing State Transition Range (XTCE185L – XTCEC20R)				
Voltage interruptions (0 – 0.2 x U_{cmin}) ≤ 10ms (0 – 0.2 x U_{cmin}) > 10ms	Time is bridged successfully Drop-out of the contactor			
Voltage Dips (0.2 – 0.6 x U_{cmin}) ≤ 12ms (0.2 – 0.6 x U_{cmin}) > 12ms (0.6 – 0.7 x U_{cmin})	Time is bridged successfully Drop-out of the contactor Contactor remains switched on			
Excess Voltage (1.15 – 1.3 x U_{cmax}) (>1.3 x U_{cmax}) ≤ 3s (>1.3 x U_{cmax}) > 3s	Contactor remains switched on Contactor remains switched on Drop-out of the contactor			
Pick – Up phase (0 – 0.7 x U_{cmin}) (0.7 x U_{cmin} –1.15 x U_{cmax}) (>1.15 x U_{cmax})	Contactor does not switch on Contactor switches on with certainty Contactor switches on with certainty			
Permissible contact resistance (of the external command device with actuation of A11), Ω	≤ 500	≤ 500	≤ 500	≤ 500
Permissible residual current (with actuation of A11 by the electronics with 0 signal)	≤ 1	≤ 1	≤ 1	≤ 1
SPS Signal Level (A3 – A4) to IEC/EN 61131-2 (Type 2) High Low	 15V 5V	 15V 5V	 15V 5V	 15V 5V
Electromagnetic compatibility (EMC)	This product is designed for operation in industrial environments. Usage in domestic areas can cause radio frequency interference (RFI). Noise suppression measures must be provided for the additional interference.			

① Control transformer with U_k ≤6%.

Table 106. Coil Data — Frames L – R (Continued)

Description	XTCE580N	XTCE750N, XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R
Voltage Tolerance					
Pick-Up (x U_c)					
XTCE185L – XTCEC20R	0.7 x U_{cmin} — 1.15 x U_{cmax}				
XTCS185L – XTCS500M	0.85 x U_{cmin} — 1.1 x U_{cmax}				
Drop-Out (x U_c)					
XTCE185L – XTCEC20R	0.2 x U_{cmin} — 0.6 x U_{cmax}				
XTCS185L – XTCS500M	0.2 x U_{cmin} — 0.4 x U_{cmax}				
Power Consumption of the coil at cold state and 1.0 x U_C					
XTCE185L – XTCEC20R					
Pick-Up VA	800 ①	800 ①	800 ①	800 ①	1600 ①
Pick-Up W	700	700	700	700	1400
Sealing VA	7.5	7.5	7.5	7.5	15
Sealing W	6.5	6.5	6.5	6.5	13
XTCS185L — XTCS500M					
Pick-Up VA	—	—	—	—	—
Pick-Up W	—	—	—	—	—
Sealing VA	—	—	—	—	—
Sealing W	—	—	—	—	—
Duty Factor (%DF)	100	100	100	100	100
Switching Time at 100% Main Contact U_C (approximate values)					
XTCE185L – XTCEC20R					
Closing delay (mS)	<70	<70	<70	<70	<70
Opening delay (mS)	<70	<70	<70	<40	<40
XTCS185L – XTCS500M					
Closing delay (mS)	—	—	—	—	—
Opening delay (mS)	—	—	—	—	—
Reaction in Threshold and Sealing State Transition Range (XTCE185L – XTCEC20R)					
Voltage interruptions					
(0 – 0.2 x U_{cmin}) ≤ 10ms	Time is bridged successfully				
(0 – 0.2 x U_{cmin}) > 10ms	Drop-out of the contactor				
Voltage Dips					
(0.2 – 0.6 x U_{cmin}) ≤ 12ms	Time is bridged successfully				
(0.2 – 0.6 x U_{cmin}) > 12ms	Drop-out of the contactor				
(0.6 – 0.7 x U_{cmin})	Contactor remains switched on				
Excess Voltage					
(1.15 – 1.3 x U_{cmax})	Contactor remains switched on				
(>1.3 x U_{cmax}) ≤ 3s	Contactor remains switched on				
(>1.3 x U_{cmax}) > 3s	Drop-out of the contactor				
Pick – Up phase					
(0 – 0.7 x U_{cmin})	Contactor does not switch on				
(0.7 x U_{cmin} –1.15 x U_{cmax})	Contactor switches on with certainty				
(>1.15 x U_{cmax})	Contactor switches on with certainty				
Permissible contact resistance (of the external command device with actuation of A11), Ω	≤ 500	≤ 500	≤ 500	≤ 500	≤ 500
Permissible residual current (with actuation of A11 by the electronics with 0 signal)	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
SPS Signal Level (A3 – A4) to IEC/EN 61131-2 (Type 2)					
High	15V	15V	15V	15V	15V
Low	5V	5V	5V	5V	5V
Electromagnetic compatibility (EMC)	This product is designed for operation in industrial environments. Usage in domestic areas can cause radio frequency interference (RFI). Noise suppression measures must be provided for the additional interference.				

① Control transformer with U_k ≤7%.

Overload Relays

These tripping characteristics are the mean values of the spread at 20°C ambient temperature in a cold state.

Tripping time depends on response current. With devices at operating temperature, the tripping time of the overload relay reduces to approximately 25% of the read off value. Specific characteristics for each individual setting range can be found in MN03402001E.

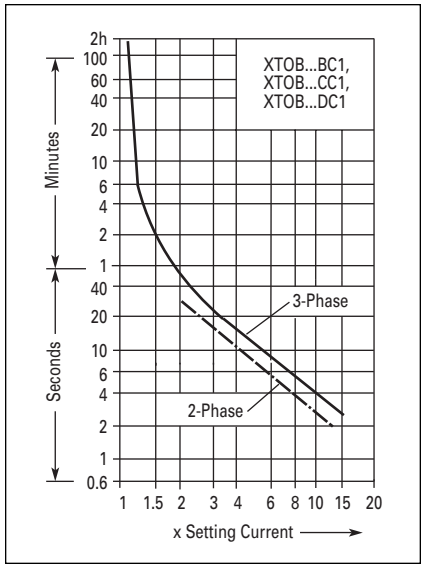


Figure 36. Tripping Characteristics

Table 107. Overload Relay — Technical Data and Specifications

Description	XTOB…BC1, XTOB…CC1	XTOB…DC1
General		
Standards	IEC/EN 60947, VDE 0660, UL, CSA	IEC/EN 60947, VDE 0660, UL, CSA
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30
Ambient Temperature ①	-25 to 50°C [-13 to 122°F]	-25 to 50°C [-13 to 122°F]
Temperature Compensation	Continuous	Continuous
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal Shock 10 mS	 10g	 10g
Degree of Protection	IP20	IP20
Protection against Direct Contact when Actuated from Front (IEC 536)	Finger and back of hand proof	Finger and back of hand proof
Insulation Voltage (U_i) VAC	690	690
Overvoltage Category /Pollution Degree	III/3	III/3
Impulse Withstand Voltage (U_{imp}) VAC	6000	6000
Operational Voltage (U_e) VAC	690	690
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between auxiliary contacts and main contacts (VAC) Between main contacts (VAC)	 440 440	 440 440
Overload Relay Setting Range	0.1 – 32A	6 – 75A
Temperature Compensation Residual Error >20°C (%/K)	≤ 0.25	≤ 0.25
Current Heat Loss (3 Conductors) Lower value of setting range, W Upper value of setting range, W	 2.5 6	 3 7.5
Terminal Capacity Solid, mm^2 Flexible with ferrule, mm^2	2 x (1 – 6) 2 x (1 – 4) 2 x (1 – 6) ②	2 x (1 – 16) 1 x 25 2 x (1 – 10) ③
Solid or Stranded, AWG	14-8	14-2
Terminal Screw Tightening Torque Nm Lb-in	M4 1.8 16	M6 3.5 31
Tools Pozidrive screwdriver Standard screwdriver	 Size 2 1 x 6	 Size 2 1 x 6

① Ambient temperature operating range to IEC/EN 60947, PTB: -5°C to +50°C.

② 6 mm^2 flexible with ferrules to DIN 46228.

③ Main contact terminal capacity, solid and stranded conductors with ferrules: When using 2 conductors use identical cross-section.

Table 107. Overload Relay — Technical Data and Specifications (Continued)

Description	XTOB…BC1, XTOB…CC1	XTOB…DC1
Auxiliary and Control Circuit Connections		
Impulse Withstand Voltage (U_{imp}) VAC	6000	6000
Overvoltage Category/Pollution Degree	III/3	III/3
Terminal Capacity Solid, mm^2 Flexible with ferrule, mm^2 Solid or stranded, AWG	 2 x (0.75 – 4) 2 x (0.75 – 2.5) 2 x (18 – 12)	 2 x (0.75 – 4) 2 x (0.75 – 2.5) 2 x (18 – 12)
Terminal Screw Tightening Torque Nm Lb-in	M3.5 0.8 – 1.3 7 – 11.5	M3.5 0.8 – 1.3 7 – 11.5
Tools Pozidrive screwdriver Standard screwdriver	 Size 2 1 x 6	 Size 2 1 x 6
Auxiliary Circuit Rated Insulation Voltage (U_i) VAC	500	500
Rated Operational Voltage (U_e) VAC	500	500
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between the auxiliary contacts (VAC)	 240	 240
Conventional Thermal Current, I_{th}	6	6
Rated Operational Current — AC-15 NO Contact 120V 240V 415V 500V	 1.5 1.5 0.5 0.5	 1.5 1.5 0.5 0.5
NC Contact 120V 240V 415V 500V	 1.5 1.5 0.9 0.8	 1.5 1.5 0.9 0.8
Rated Operational Current — DC-13 L/R ≤15 mS ① 24V 60V 110V 220V	 0.9 0.75 0.4 0.2	 0.9 0.75 0.4 0.2
Short Circuit Rating without Welding Maximum fuse, A gG/gL	 6	 6

① Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated.

Auxiliary Contacts

Table 108. Auxiliary Contacts Technical Data and Specifications

Description	XTCE007B…– XTCE032C	XTCEXFAC…	XTCEXFCC…	XTCEXFAG…	XTCEXSBLN… XTCEXSBN… XTCEXSBNC… XTCEXSCN… XTCEXSCNC…
Interlocked opposing contacts with an auxiliary contact module (to IEC 60947-5 -1 Annex L)	—	Yes	Yes	Yes	Yes
Break contact (not late-break contact) suitable as a mirror contact (to IEC/EN 60947-4 -1 Annex F)	XTCE007B… – XTCE032C	XTCE007B… – XTCE032C	XTCE007B… – XTCE032C	XTCE040D… – XTCE065D…	XTCE040D… – XTCE065D… XTCE185L… – XTCEC10N…
Rated impulse withstand voltage, (U_{imp}) VAC	6000	6000	6000	6000	6000
Overvoltage category / pollution degree	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage, (U_i) VAC	690	690	690	690	690
Rated operational voltage, (U_e) VAC	500	500	500	500	500
Safe isolation to VDE 0106 Part 101 and Part 101(A) in VAC					
Between coil and auxiliary contacts	400	400	400	440	440
Between the auxiliary contacts	400	400	400	440	440
Rated Operational Current, I_e					
AC-15					
230V	6A	6A	6A	6A	6A
380/415V	4A	4A	4A	4A	4A
500V	1.5A	—	1.5A	1.5A	1.5A
DC-3 L/R ≤5 mS ①					
24V	10A	10A	10A	10A	10A
60V	6A	6A	6A	6A	6A
110V	3A	3A	3A	3A	3A
220V	1A	1A	1A	1A	1A
Conventional thermal current, I_{th}	10A	10A	10A	10A	10A
Control circuit reliability (at U_e = 24 V DC, U_{min} = 17 V, I_{min} = 5.4 mA)	$<10^{-8}$, < one failure at 100 million operations				
Component Lifespan, Operations x 10^6 at U_e = 230V, AC-15, 3A	1.3	1.3	1.3	1.3	1.3
Short-circuit rating without welding ② Maximum fuse, gG/gL	10A	10A	10A	16A	16A

① Making and breaking conditions to DC-13, time L/R contact as stated.

② See fuses overlay for time/current characteristic (on request).

AC Ratings

Table 109. AC Ratings

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
AC-1 Operation							
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz							
at 40°C (I_{th})	22A	22A	22A	22A	40A	45A	45A
at 50°C (I_{th})	21A	21A	21A	21A	38A	43A	43A
at 55°C (I_{th})	21A	21A	21A	21A	37A	42A	42A
at 60°C (I_{th})	20A	20A	20A	20A	35A	40A	40A
Conventional Free Air Thermal Current, 1-Pole (I_{th})	50A	50A	50A	50A	85A	85A	85A
AC-3 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	7	9	12	15.5	18	25	32
240V	7	9	12	15.5	18	25	32
380/400V	7	9	12	15.5	18	25	32
415V	7	9	12	15.5	18	25	32
440V	7	9	12	15.5	18	25	32
500V	5	7	10	12.5	18	25	32
660/690V	4	5	7	9	12	15	18
1000V	—	—	—	—	—	—	—
Rated power (P) in kilowatts							
220/230V	2.2	2.5	3.5	4	5	7.5	10
240V	2.2	3	4	4.6	5.5	8.5	11
380/400V	3	4	5.5	7.5	7.5	11	15
415V	4	5.5	7	8	10	14.5	19
440V	4.5	5.5	7.5	8.4	10.5	15.5	20
500V	3.5	4.5	7	7.5	12	17.5	23
660/690V	3.5	4.5	6.5	7	11	14	17
1000V	—	—	—	—	—	—	—
AC-4 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	5	6	7	7	10	13	15
240V	5	6	7	7	10	13	15
380/400V	5	6	7	7	10	13	15
415V	5	6	7	7	10	13	15
440V	5	6	7	7	10	13	15
500V	4.5	5	6	6	10	13	15
660/690V	4	4.5	5	5	8	10	12
1000V	—	—	—	—	—	—	—
Rated power (P) in kilowatts							
220/230V	1	1.5	2	2	2.5	3.5	4
240V	1.5	1.6	2.2	2.2	3	4	4.5
380/400V	2.2	2.5	3	3	4.5	6	7
415V	2.3	2.8	3.4	3.4	5	6.5	7.5
440V	2.4	3	3.6	3.6	5.5	7	8
500V	2.5	2.8	3.5	3.5	6	8	9
660/690V	2.9	3.6	4.4	4.4	6.5	8.5	10
1000V	—	—	—	—	—	—	—
AC-6A Operation							
Transformer Loads	Values are application specific. Calculation is $I_{eAC-3} = X / 6 * I_e$ Transformer where X is the inrush current of the transformer and Ie Transformer is the nominal current. ②						
AC-6B Operation							
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes							
Up to 525V	—	—	—	—	—	—	—
690V	—	—	—	—	—	—	—
Maximum inrush current peak (x I_e)	—	—	—	—	—	—	—
Component Lifesaving (Operations)	—	—	—	—	—	—	—
Maximum Operating Frequency (ops/hr)	—	—	—	—	—	—	—

① At maximum permissible ambient temperature.

② Example —
The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of 18/6 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

Table 109. AC Ratings (Continued)

Description	XTCE040D	XTCE050D	XTCE065D	XTCE080F	XTCE095F	XTCE115G	XTCE150G
AC-1 Operation							
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz							
at 40°C (I_{th})	60A	70A	85A	130	130	190	190
at 50°C (I_{th})	57A	65A	80A				
at 55°C (I_{th})	55A	63A	75A				
at 60°C (I_{th})	50A	60A	72A	110	110	160	160
Conventional Free Air Thermal Current, 1-Pole (I_{th})	125A	150A	180A				
AC-3 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	40	50	65	80	95	115	150
240V	40	50	65	80	95	115	150
380/400V	40	50	65	80	95	115	150
415V	40	50	65	80	95	115	150
440V	40	50	65	80	95	115	150
500V	40	50	65	80	95	115	150
660/690V	25	32	37	65	80	110	132
1000V	—	—	—				
Rated power (P) in kilowatts							
220/230V	12.5	15.5	20	25	30	37	48
240V	13.5	17	22	—	—	—	—
380/400V	18.5	22	30	37	45	55	75
415V	24	30	39	—	—	—	—
440V	25	32	41	—	—	—	—
500V	28	36	47	58	70	85	110
660/690V	23	30	35	63	75	105	125
1000V	—	—	—	—	—	—	—
AC-4 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	18	21	25	37	40	55	65
240V	18	21	25	37	40	55	65
380/400V	18	21	25	37	40	55	65
415V	18	21	25	37	40	55	65
440V	18	21	25	37	40	55	65
500V	18	21	25	37	40	55	65
660/690V	14	17	20	27	37	45	50
1000V	—	—	—	15	17	22	25
Rated power (P) in kilowatts							
220/230V	5	6	7	11.5	13	17	20
240V	5.5	6.5	7.5	13	14	19	23
380/400V	9	10	12	19	20	28	34
415V	9.5	11	13	22	24	33	39
440V	10	12	14	23	26	35	41
500V	11	13	16	27	29	40	47
660/690V	12	14	17	26	36	45	48
1000V	—	—	—	22	25	32	37
AC-6A Operation							
Transformer Loads	Values are application specific. Calculation is I_{eAC-3} = X / 6 * Ie Transformer where X is the inrush current of the transformer and Ie Transformer is the nominal current. ②						
AC-6B Operation							
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes							
Up to 525V	—	—	—	—	—	—	—
690V	—	—	—	—	—	—	—
Maximum inrush current peak (x I_e)	—	—	—	—	—	—	—
Component Lifesaving (Operations)	—	—	—	—	—	—	—
Maximum Operating Frequency (ops/hr)	—	—	—	—	—	—	—

① At maximum permissible ambient temperature.

② Example —
The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of 18/6 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

Table 109. AC Ratings (Continued)

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M	XTCE580N
AC-1 Operation							
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz							
at 40°C (I_{th})	337	386	429	490	612	857	980
at 50°C (I_{th})	301	345	383	438	548	767	876
at 55°C (I_{th})	287	329	366	418	522	731	836
at 60°C (I_{th})	275	315	350	400	500	700	800
Conventional Free Air Thermal Current, 1-Pole (I_{th})	685	785	875	1000	1250	1750	2000
AC-3 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	185	225	250	300	400	500	580
240V	185	225	250	300	400	500	580
380/400V	185	225	250	300	400	500	580
415V	185	225	250	300	400	500	580
440V	185	225	250	300	400	500	580
500V	185	225	250	300	400	500	580
660/690V	185	225	250	300	400	500	580
1000V	76	76	76	95	95	95	435
Rated power (P) in kilowatts							
220/230V	55	70	75	90	125	155	185
240V	62	75	85	100	132	170	200
380/400V	90	110	132	160	200	250	315
415V	110	132	148	180	240	300	348
440V	115	142	157	190	255	345	370
500V	132	160	180	215	290	360	420
660/690V	175	215	240	286	344	344	560
1000V	108	108	108	132	132	132	600
AC-4 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	136	164	200	240	296	360	456
240V	136	164	200	240	296	360	456
380/400V	136	164	200	240	296	360	456
415V	136	164	200	240	296	360	456
440V	136	164	200	240	296	360	456
500V	136	164	200	240	296	360	456
660/690V	136	164	200	240	296	296	456
1000V	76	76	76	95	95	95	348
Rated power (P) in kilowatts							
220/230V	41	51	62	75	92	112	143
240V	45	54	68	82	101	122	156
380/400V	75	90	110	132	160	200	250
415V	80	96	117	142	176	216	274
440V	85	102	125	151	186	229	290
500V	96	116	143	172	214	260	330
660/690V	127	155	189	229	283	344	440
1000V	108	108	108	132	132	132	509
AC-6A Operation							
Transformer Loads	Values are application specific. Calculation is $I_{eAC-3} = X / 6 * I_e$ Transformer where X is the inrush current of the transformer and Ie Transformer is the nominal current. ②						
AC-6B Operation							
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes							
Up to 525V	220	220	220	307	307	307	463
690V	133	133	133	177	177	177	265
Maximum inrush current peak (x I_e)	30	30	30	30	30	30	30
Component Lifesaving (Operations)	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Maximum Operating Frequency (ops/hr)	200	200	200	200	200	200	200

① At maximum permissible ambient temperature.

② Example —
The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of 18/6 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

Table 109. AC Ratings (Continued)

Description	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R
AC-1 Operation						
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz						
at 40°C (I_{th})	1041	1102	1225	1225	1714	2450
at 50°C (I_{th})	931	986	1095	1095	1533	2190
at 55°C (I_{th})	888	940	1044	1044	1462	2089
at 60°C (I_{th})	850	900	1000	1000	1400	2000
Conventional Free Air Thermal Current, 1-Pole (I_{th})	2125	2250	2500	2500	3500	5000
AC-3 Operation						
Rated Operational Current, 50/60 Hz ① (I_e) in amperes						
220/230V	650	750	820	1000	—	—
240V	650	750	820	1000	—	—
380/400V	650	750	820	1000	—	—
415V	650	750	820	1000	—	—
440V	650	750	820	1000	—	—
500V	650	750	820	1000	—	—
660/690V	650	750	820	1000	—	—
1000V	435	580	580	700	—	—
Rated power (P) in kilowatts						
220/230V	205	240	260	315	—	—
240V	225	260	285	340	—	—
380/400V	355	400	450	560	—	—
415V	390	455	500	610	—	—
440V	420	480	525	650	—	—
500V	470	550	600	730	—	—
660/690V	630	720	750	1000	—	—
1000V	600	800	800	1000	—	—
AC-4 Operation						
Rated Operational Current, 50/60 Hz ① (I_e) in amperes						
220/230V	512	576	656	800	—	—
240V	512	576	656	800	—	—
380/400V	512	576	656	800	—	—
415V	512	576	656	800	—	—
440V	512	576	656	800	—	—
500V	512	576	656	800	—	—
660/690V	512	576	656	800	—	—
1000V	348	464	464	700	—	—
Rated power (P) in kilowatts						
220/230V	161	181	209	260	—	—
240V	176	200	228	280	—	—
380/400V	280	315	355	450	—	—
415V	307	346	394	490	—	—
440V	326	367	418	520	—	—
500V	370	417	474	590	—	—
660/690V	494	556	633	780	—	—
1000V	509	678	678	1000	—	—
AC-6A Operation						
Transformer Loads	Values are application specific. Calculation is I_{eAC-3} = X / 6 * Ie Transformer where X is the inrush current of the transformer and Ie Transformer is the nominal current. ②					
AC-6B Operation						
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes						
Up to 525V	463	463	463	463	—	—
690V	265	265	265	265	—	—
Maximum inrush current peak (x I_e)	30	30	30	30	—	—
Component Lifesaving (Operations)	100,000	100,000	100,000	100,000	—	—
Maximum Operating Frequency (ops/hr)	200	200	200	200	—	—

① At maximum permissible ambient temperature.

② Example —
The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of 18/6 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

DC Ratings

Table 110. DC Ratings — DC-1

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operation current {1} (I_e) in amperes							
60V	20	20	20	20	35	40	40
110V	20	20	20	20	35	40	40
220V	15	15	15	15	35	40	40
440V	1	1.3	1.3	1.3	2.9	2.9	2.9
	XTCE040D	**XTCE050D**	**XTCE065D**	**XTCE080F**	**XTCE095F**	**XTCE115G**	**XTCE150G**
60V	50	60	72	—	—	—	—
110V	50	50	72	—	—	—	—
220V	45	45	65	—	—	—	—
440V	2.9	2.9	2.9	—	—	—	—
	XTCE185L	**XTCE225L**	**XTCE250L**	**XTCE300M**	**XTCE400M**	**XTCE500M**	**XTCE580N**
60V	300	300	300	400	400	400	—
110V	300	300	300	400	400	400	—
220V	300	300	300	400	400	400	—
440V	11	11	11	11	11	11	—
	XTCE650N	**XTCE750N**	**XTCE820N**	**XTCEC10N**	**XTCEC14P**	**XTCEC20R**	**—**
60V	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—

Table 111. DC Ratings — DC-3

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operation current {1} (I_e) in amperes							
60V	20	20	20	20	35	35	40
110V	20	20	20	20	35	35	40
220V	1.5	1.5	1.5	1.5	10	10	25
440V	0.2	0.2	0.2	0.2	0.6	0.6	0.6
	XTCE040D	**XTCE050D**	**XTCE065D**	**XTCE080F**	**XTCE095F**	**XTCE115G**	**XTCE150G**
60V	50	60	72	—	—	—	—
110V	50	50	72	—	—	—	—
220V	25	25	35	—	—	—	—
440V	0.6	0.6	0.6	—	—	—	—
	XTCE185L	**XTCE225L**	**XTCE250L**	**XTCE300M**	**XTCE400M**	**XTCE500M**	**XTCE580N**
60V	300	300	300	400	400	400	—
110V	300	300	300	400	400	400	—
220V	300	300	300	400	400	400	—
440V	—	—	—	—	—	—	—
	XTCE650N	**XTCE750N**	**XTCE820N**	**XTCEC10N**	**XTCEC14P**	**XTCEC20R**	**—**
60V	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—

Table 112. DC Ratings — DC-5

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operation current {1} (I_e) in amperes							
60V	20	20	20	20	35	35	40
110V	20	20	20	20	35	35	40
220V	1.5	1.5	1.5	1.5	10	10	25
440V	0.2	0.2	0.2	0.2	0.6	0.6	0.6

	XTCE040D	XTCE050D	XTCE065D	XTCE080F	XTCE095F	XTCE115G	XTCE150G
60V	50	60	72	—	—	—	—
110V	50	50	72	—	—	—	—
220V	25	25	35	—	—	—	—
440V	0.6	0.6	0.6	—	—	—	—

	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M	XTCE580N
60V	300	300	300	400	400	400	—
110V	300	300	300	400	400	400	—
220V	300	300	300	400	400	400	—
440V	—	—	—	—	—	—	—

	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R	—
60V	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—

Heat Loss

Table 113. Current heat loss (3-Pole) in watts

Description	XTCE007B	XTCE009B	XTCE012B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Current heat loss (3-Pole) in watts							
at I_{th}	4.7	4.7	4.7	4.7	7.3	9.6	12.1
at I_e to AC-3/400V	0.37	0.6	1.1	1.8	1.7	3.8	6.1
Impedance per pole, Ω	2.5	2.5	2.5	2.5	2	2	2

	XTCE040D	XTCE050D	XTCE065D	XTCE080F	XTCE095F	XTCE115G	XTCE150G
Current heat loss (3-Pole) in watts							
at I_{th}	11.3	16.2	15.6	—	—	—	—
at I_e to AC-3/400V	7.2	11.3	12.7	—	—	—	—
Impedance per pole, Ω	1.5	1.5	1.5	—	—	—	—

	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M	XTCE580N
Current heat loss (3-Pole) in watts							
at I_{th}	79	108	95	123	188	236	227
at I_e to AC-3/400V	36	55	48	69	120	120	120
Impedance per pole, Ω							

	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R	—
Current heat loss (3-Pole) in watts							
at I_{th}	257	288	355	355	697	711	—
at I_e to AC-3/400V	150	200	239	355	—	—	—
Impedance per pole, Ω							

Life Curves

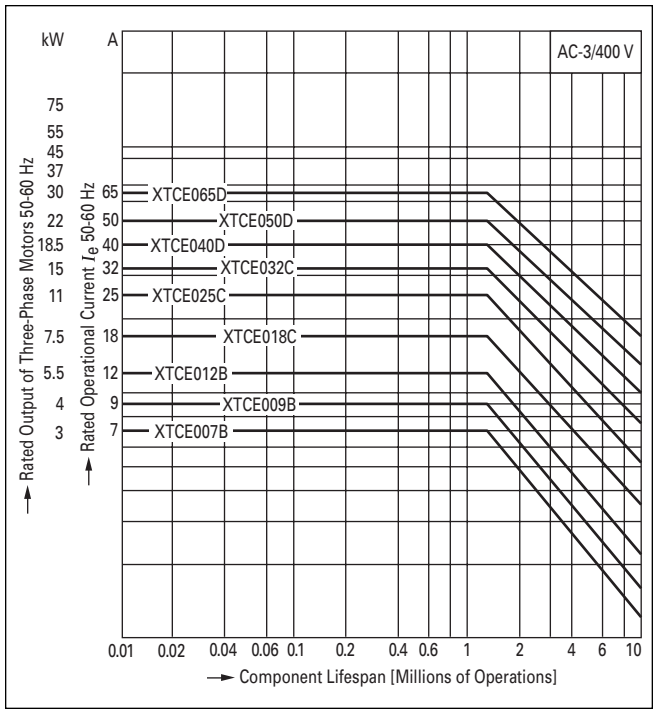


Figure 37. Normal Switching Duty — XTCE007B – XTCE065D

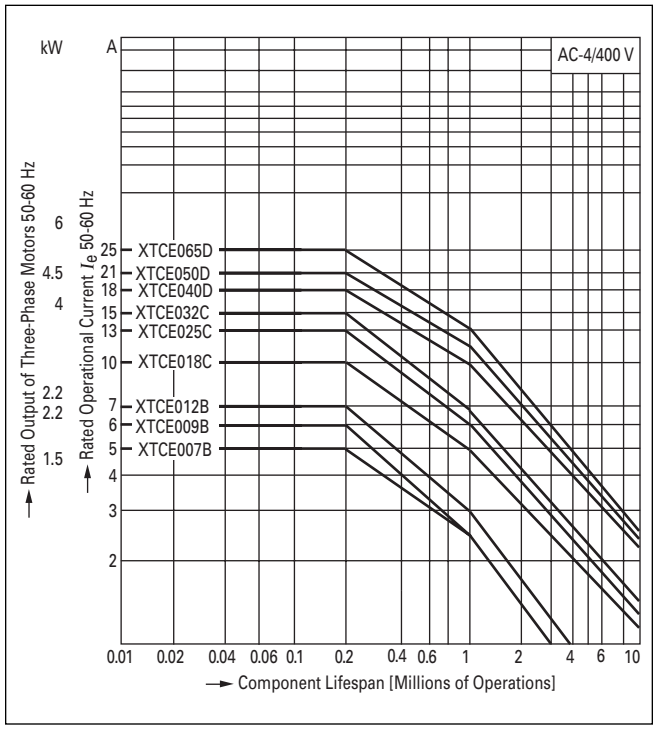


Figure 38. Extreme Switching Duty — XTCE007B – XTCE065D

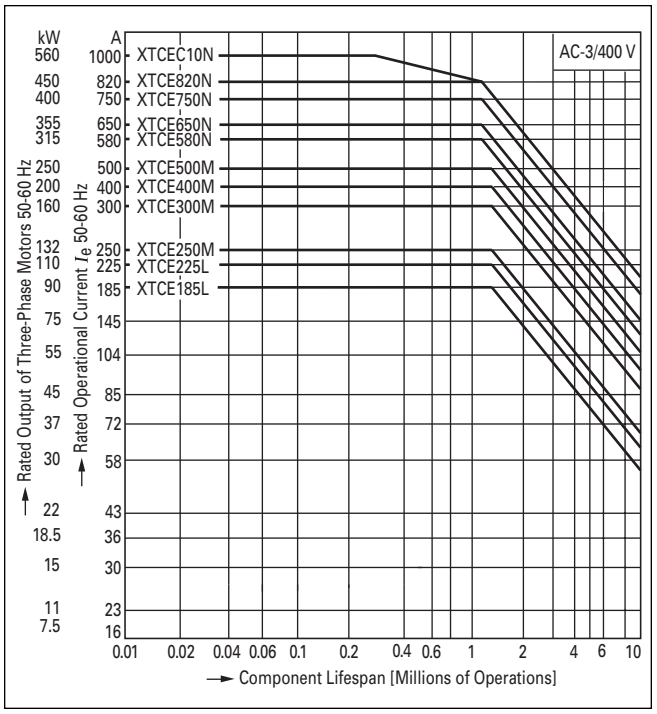


Figure 39. Normal Switching Duty — XTCE185L – XTCEC10N

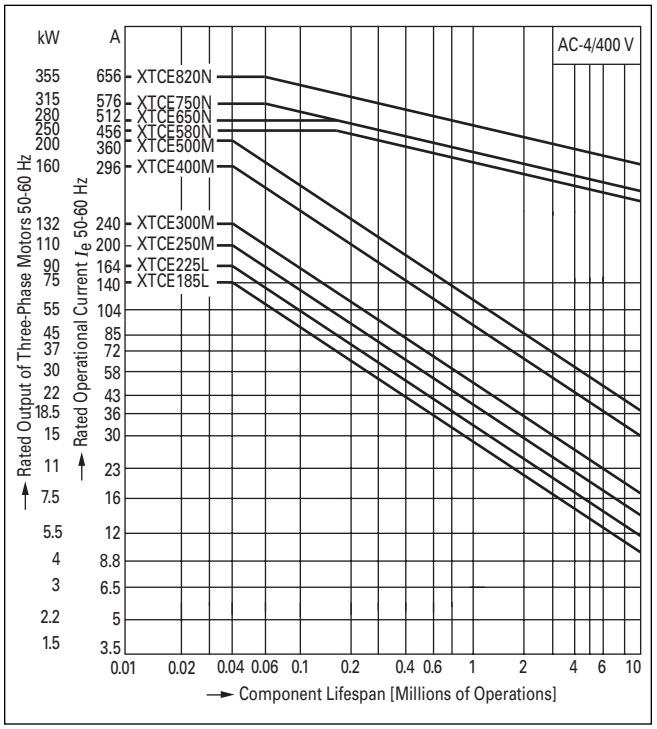


Figure 40. Extreme Switching Duty — XTCE185L – XTCE820N

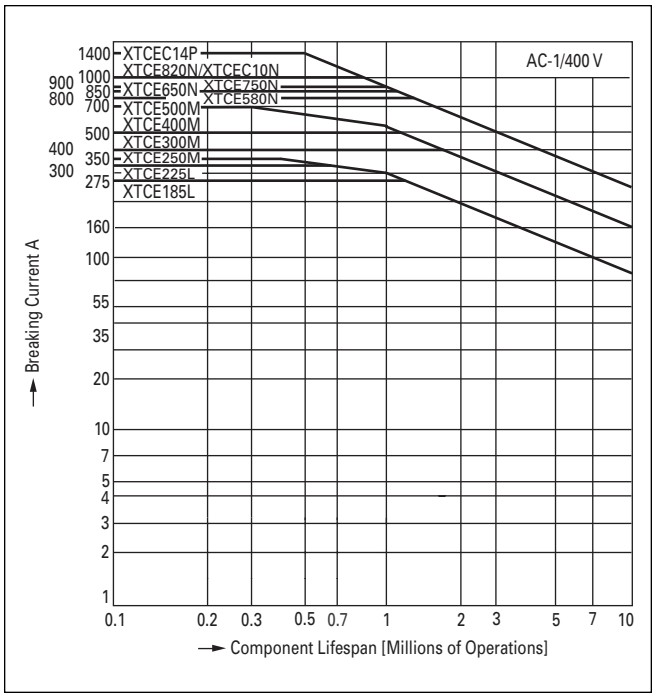


Figure 41. Switching Duty for Non-motor loads, 3-pole, 4-pole — XTCE185L – XTCEC14P

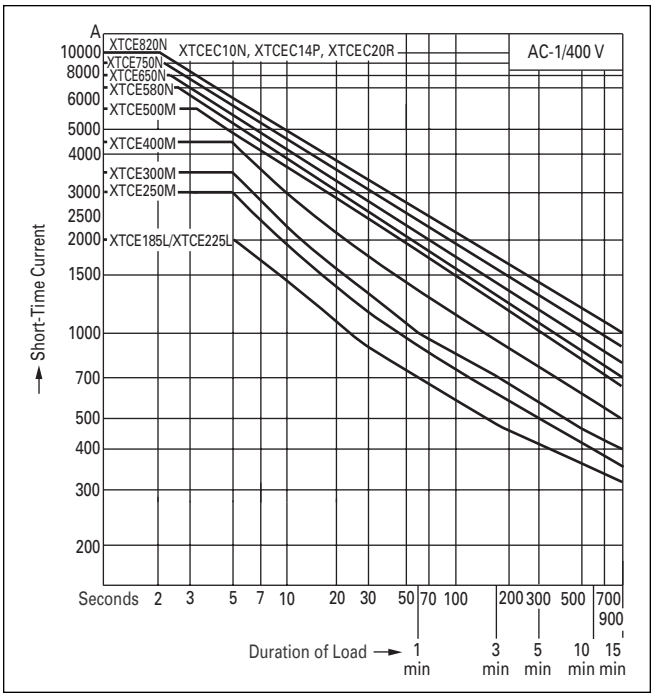


Figure 42. Short-Time Loading, 3-pole — XTCE185L – XTCEC20R

Dimensions

XTCE Contactors

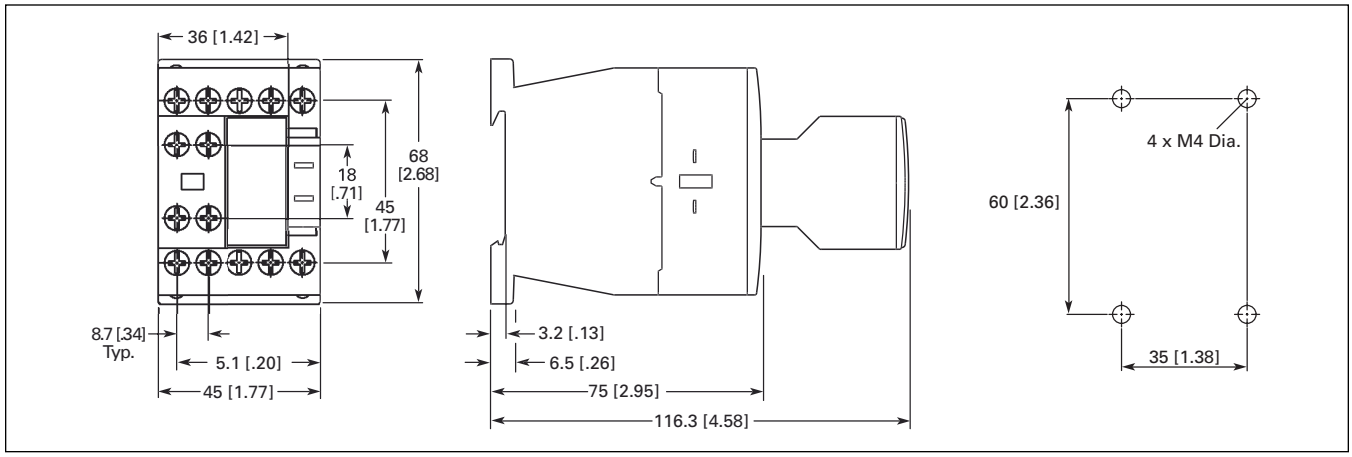


Figure 43. Frame B, XTCE007B – XTCE015B Contactors with Screw Terminals (7 – 15A) — Approximate Dimensions in mm [in]

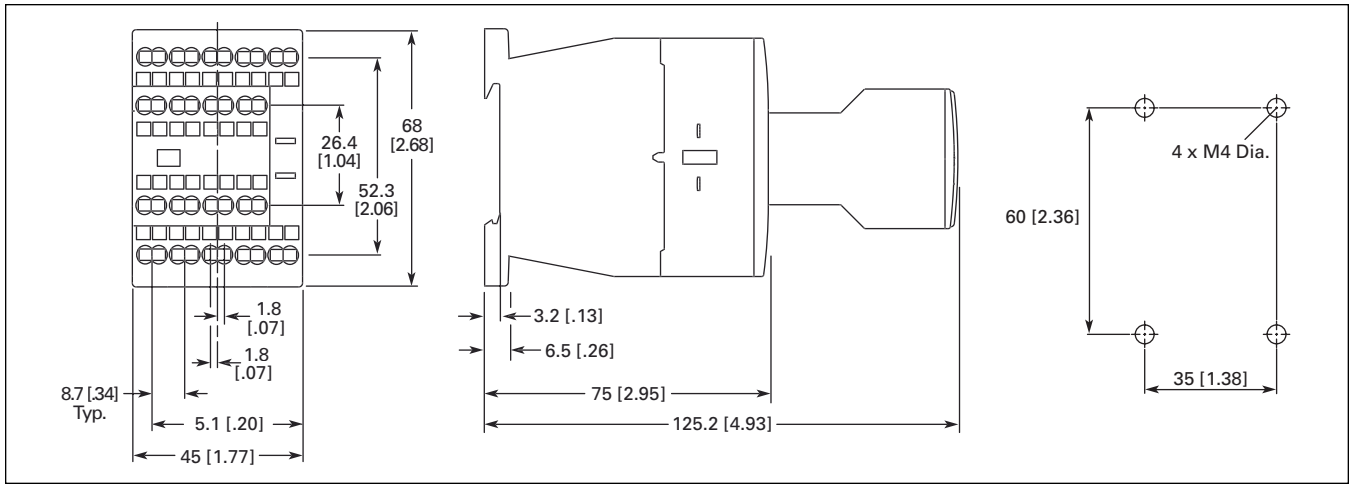


Figure 44. Frame B, XTCEC007B – XTCEC012B Contactors with Spring Cage Terminals (7 – 12A) — Approximate Dimensions in mm [in]

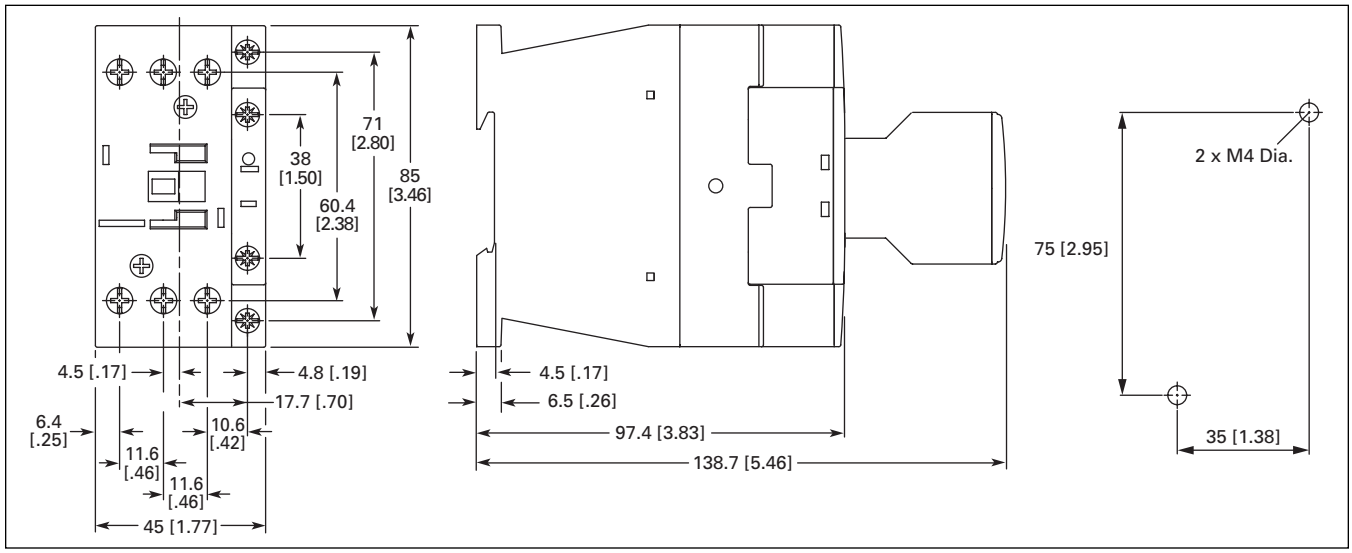


Figure 45. Frame C, XTCE018C – XTCE032C Contactors (18 – 32A) — Approximate Dimensions in mm [in]

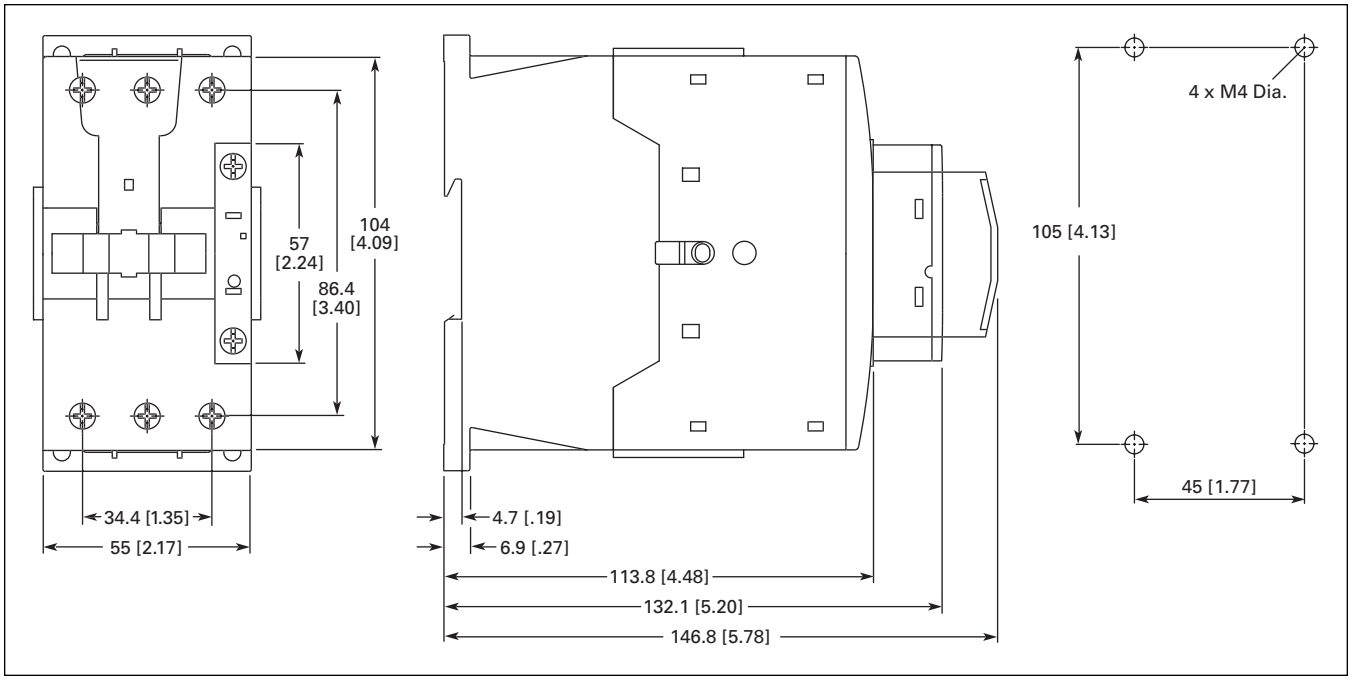


Figure 46. Frame D, XTCE040D – XTCE065D Contactors (40 – 65A) — Approximate Dimensions in mm [in]

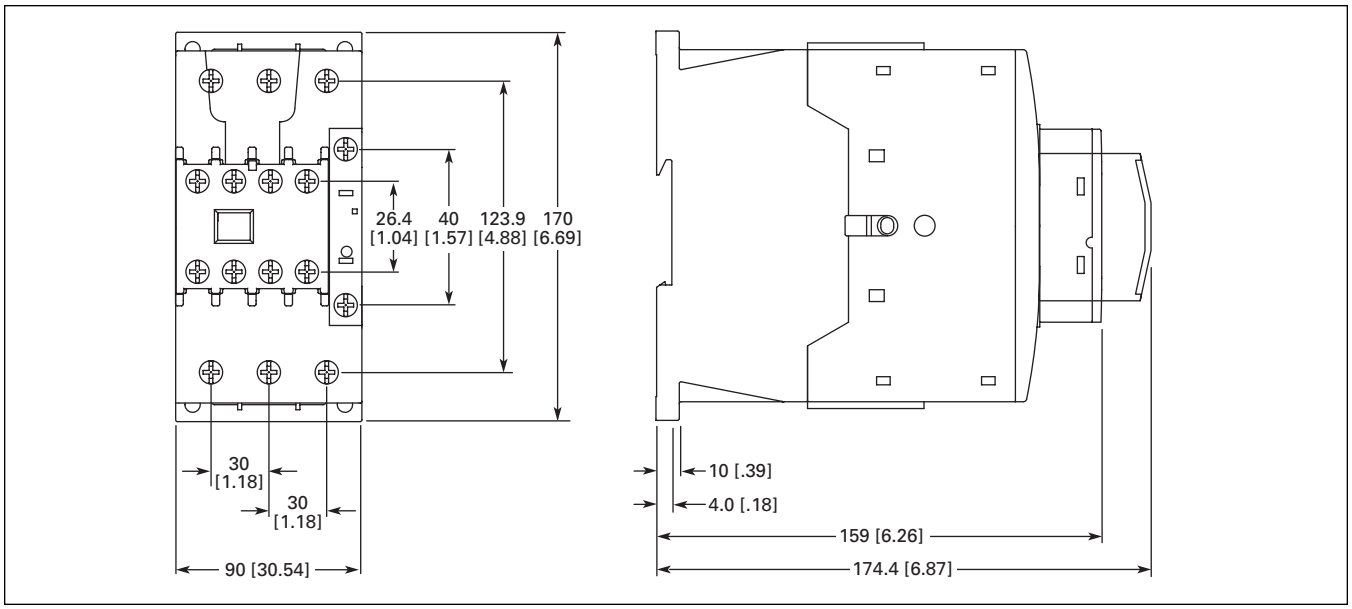


Figure 47. Frame F – G, XTCE080F – XTCE150G Contactors (80 – 150A) — Approximate Dimensions in mm [in]

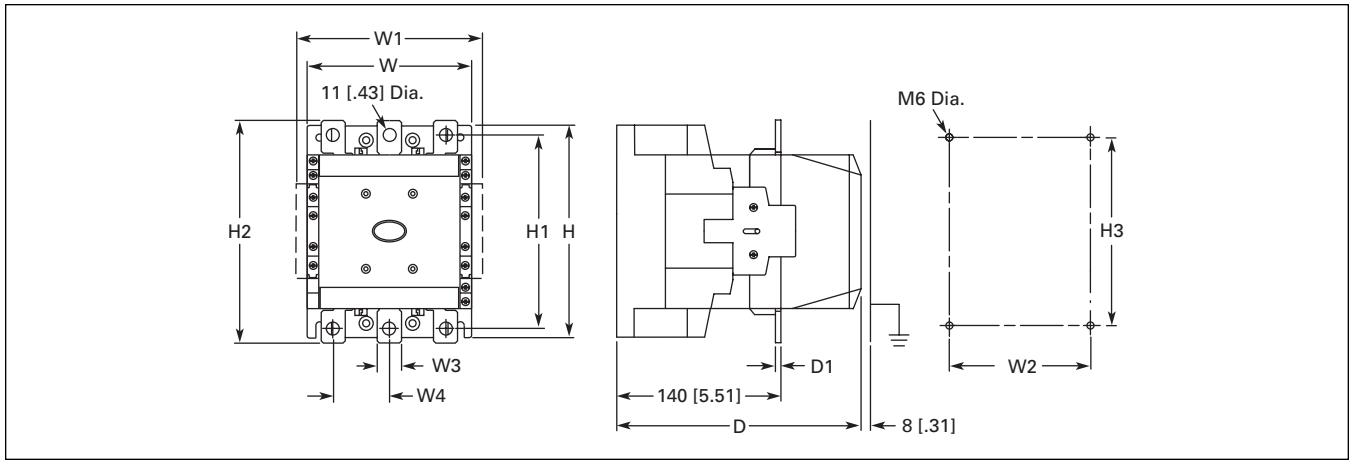


Figure 48. Frame L – M, XTCE185L – XTCE500M Contactors (185 – 500A) — Approximate Dimensions in mm [in]

Table 114. Frame L – M, XTCE185L – XTCE500M Contactors (185 – 500A) — Approximate Dimensions in mm [in]

	W	W1	W2	W3	W4	H	H1	H2	H3	D	D1
Frame L (185 – 250A)	140 [5.51]	160 [6.30]	120 [4.72]	20 [.79]	48 [1.89]	180 [7.09]	164 [6.46]	189 [7.44]	160 [6.30]	208 [8.19]	5 [.20]
Frame M (300 – 500A)	160 [6.30]	180 [7.09]	130 [5.12]	25 [.98]	48 [1.89]	200 [7.87]	184 [7.24]	209 [8.23]	180 [7.09]	216 [8.50]	6 [.24]

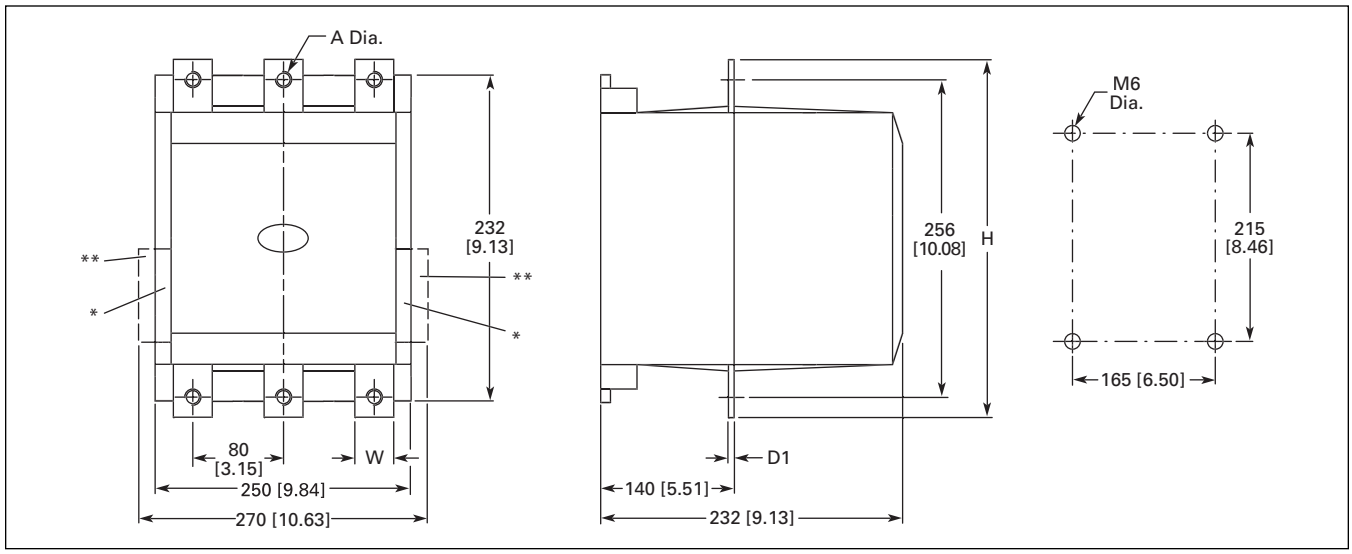


Figure 49. Frame N, XTCE580N – XTCEC10N Contactors (580 – 1000A) — Approximate Dimensions in mm [in]

Table 115. Frame N, XTCE580N – XTCEC10N Contactors (580 – 1000A) — Approximate Dimensions in mm [in]

	W	H	D1	A (Dia.)
XTCE580N	35 [1.38]	286 [11.26]	6 [.24]	11 [.43]
XTCE650N	35 [1.38]	286 [11.26]	6 [.24]	11 [.43]
XTCE750N	45 [1.77]	296 [11.65]	6 [.24]	13.5 [.53]
XTCE820N	45 [1.77]	296 [11.65]	6 [.24]	13.5 [.53]
XTCEC10N	45 [1.77]	296 [11.65]	10 [.40]	13.5 [.53]

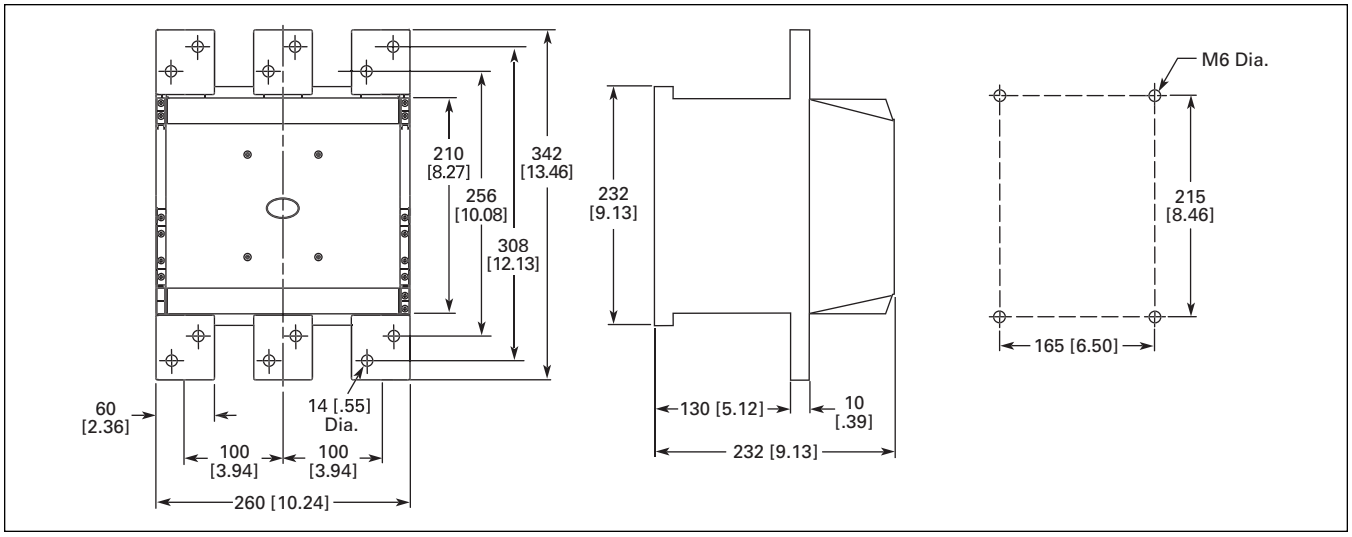


Figure 50. Frame P, XTCEC14P Contactor (1400A, AC-1) — Approximate Dimensions in mm [in]

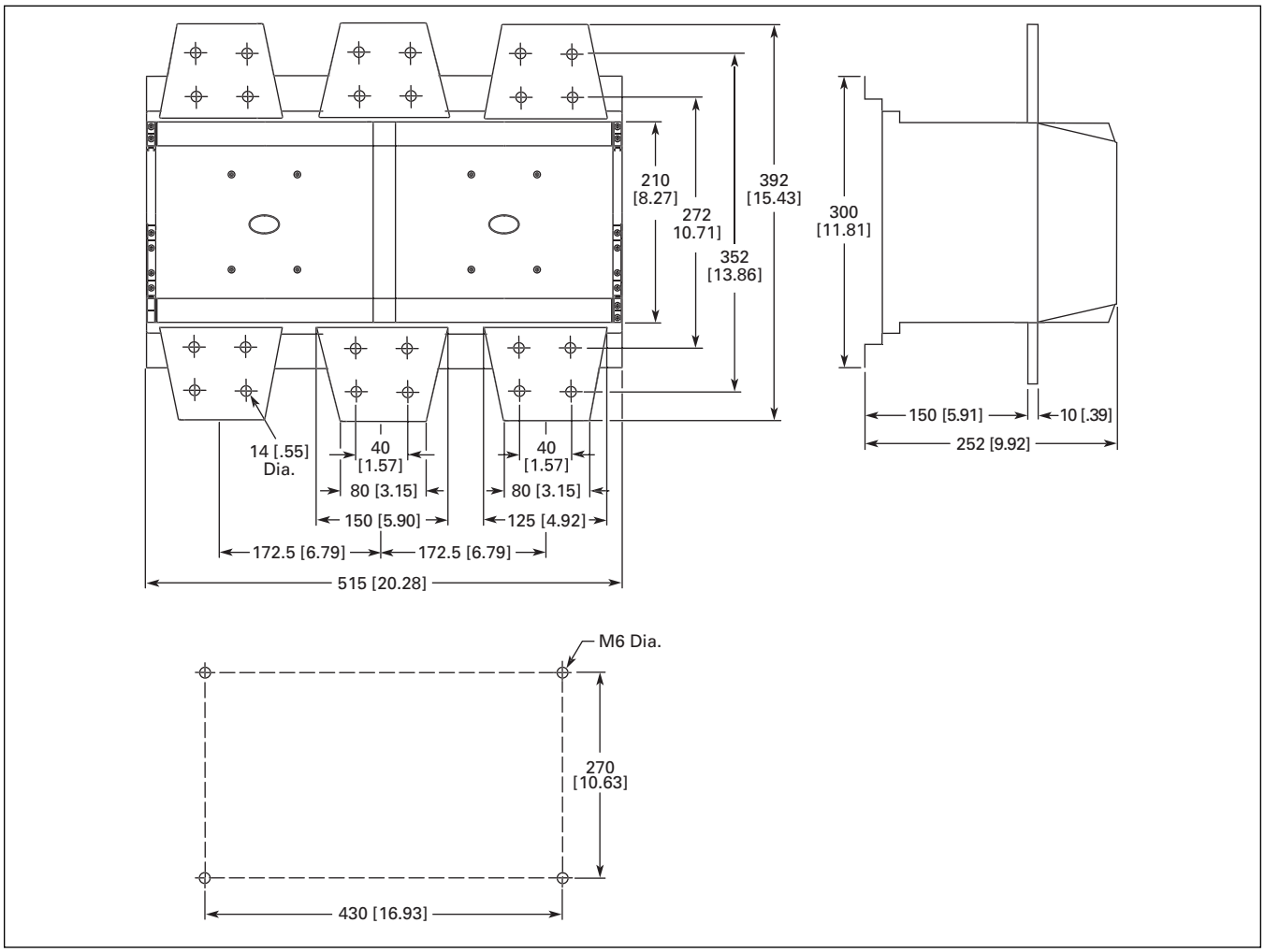


Figure 51. Frame R, XTCEC20R Contactor (2000A, AC-1) — Approximate Dimensions in mm [in]

XTAE Starters

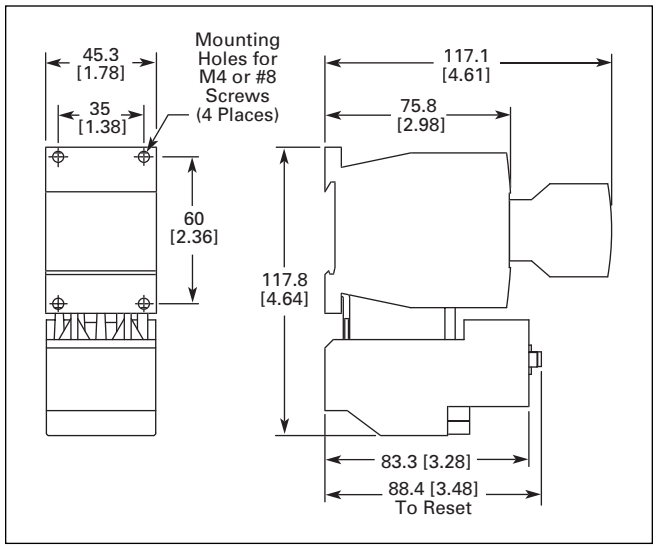


Figure 52. Frame B, XTAE007B – XTAE012B Starters (7 – 12A)

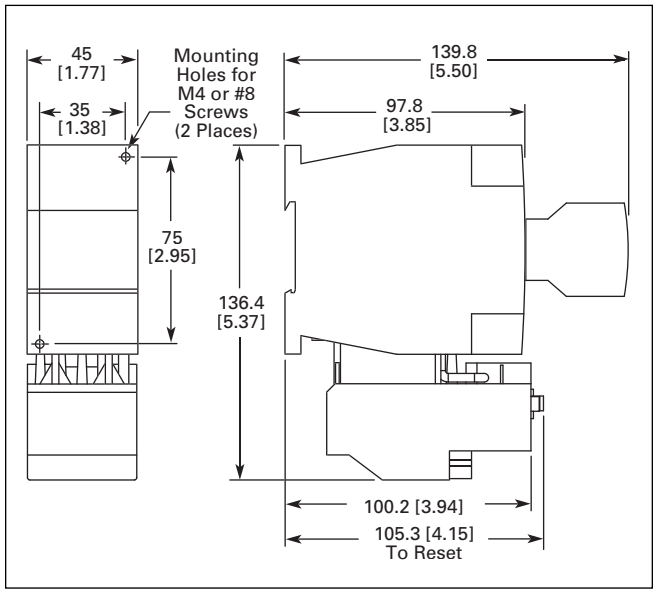


Figure 53. Frame C, XTAE018C – XTAE032C Starters (18 – 32A)

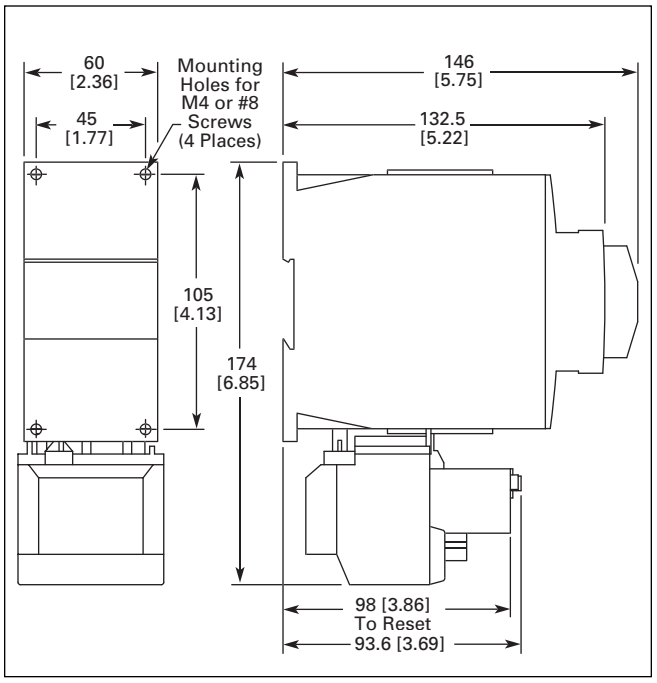


Figure 54. Frame D, XTAE040D – XTAE065D Starters (40 – 65A)

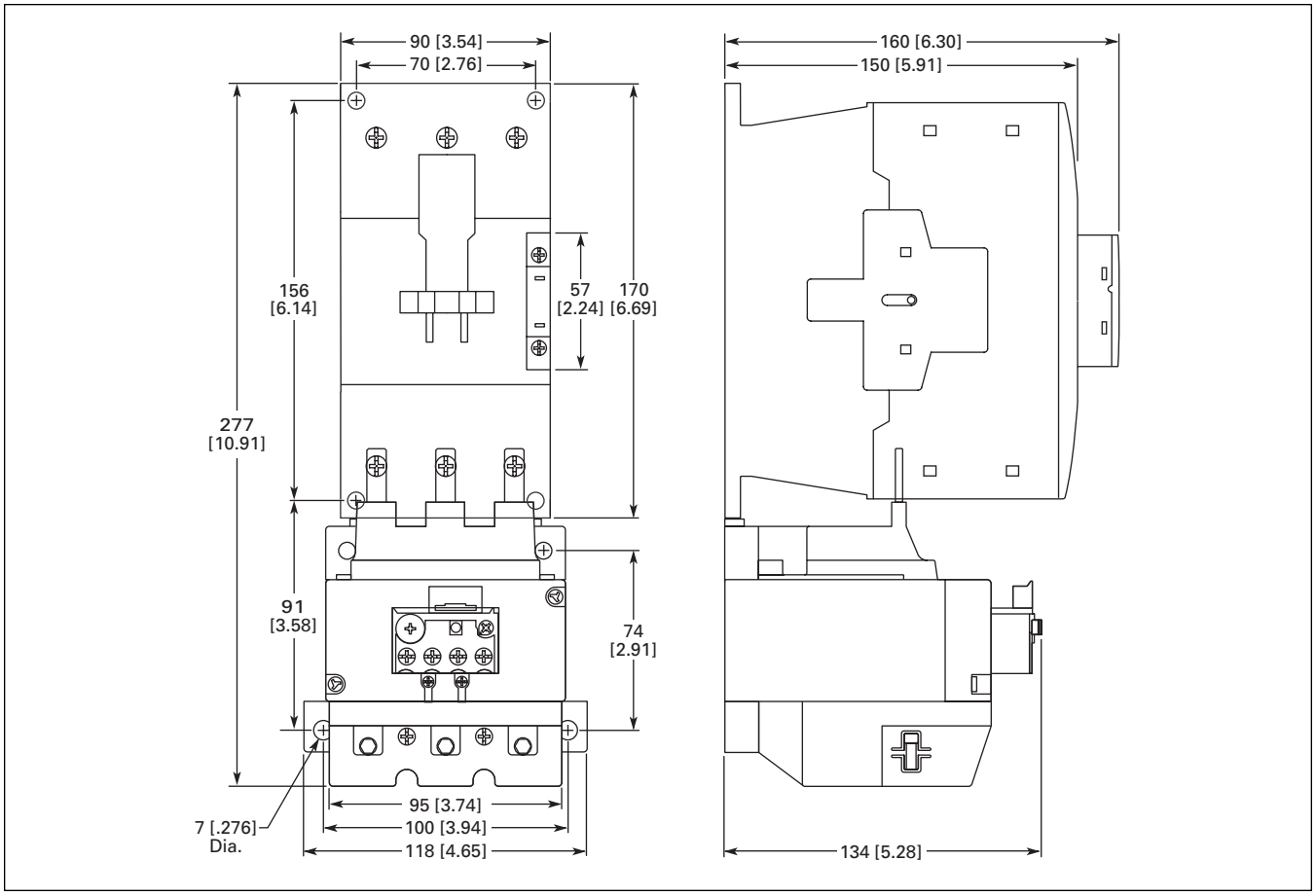


Figure 55. Frames F – G, XTAE080F – XTAE150G Starters (80 – 150A) — Approximate Dimensions in mm [in]

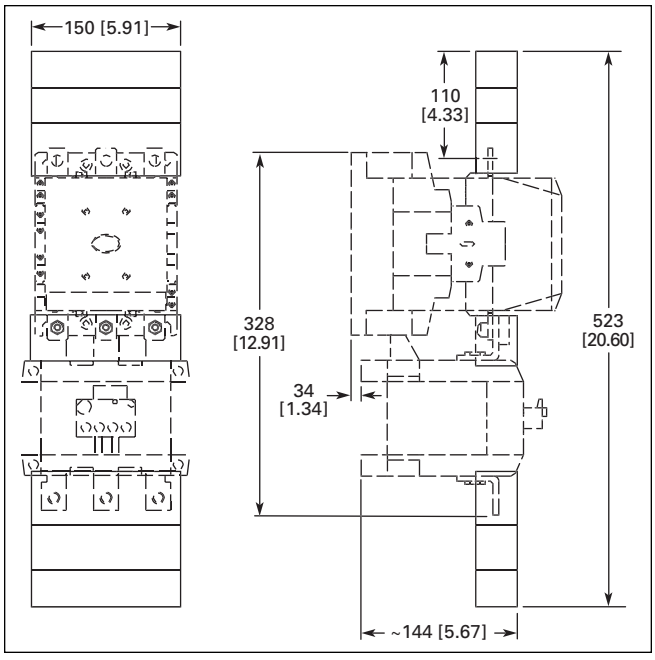


Figure 56. Frame L, XTAE185L – XTAE250L Starters (185 – 250A) — Approximate Dimensions in mm [in]

Reversing Combination

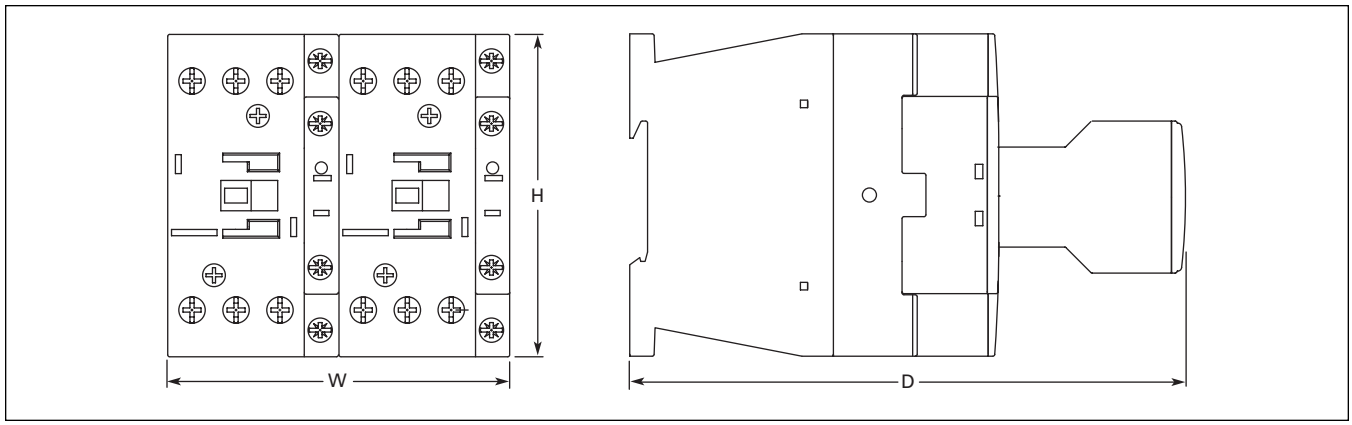


Figure 57. Reversing Combination — Approximate Dimensions in mm [in]

Table 116. Reversing Combination — Approximate Dimensions in mm [in]

Frame B (7 – 15A)			Frame C (18 – 32A)			Frame D (40 – 65A)			Frame F – G (80 – 150A)		
W	H	D	W	H	D	W	H	D	W	H	D
90 [3.54]	68 [2.68]	125.2 [4.93]	90 [3.54]	85 [3.34]	147.3 [5.80]	110 [4.33]	115 [4.53]	146.8 [5.78]	180 [7.09]	170 [6.69]	174.4 [6.87]

Overload Relays

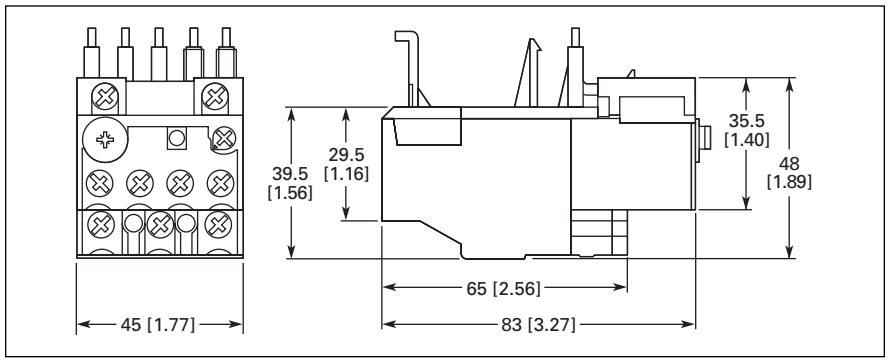


Figure 58. Frame B – C, XTOB…BC1 and XTOB…CC1 Overload Relays — Approximate Dimensions in mm [in]

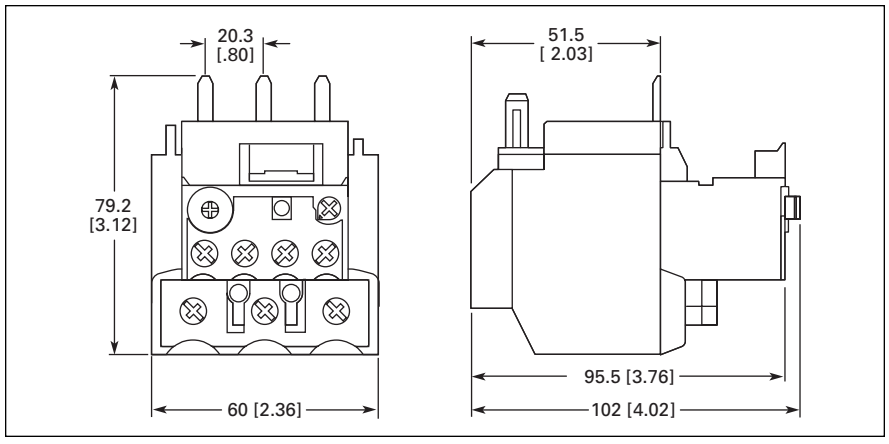


Figure 59. Frame D, XTOB…DC1 Overload Relay — Approximate Dimensions in mm [in]

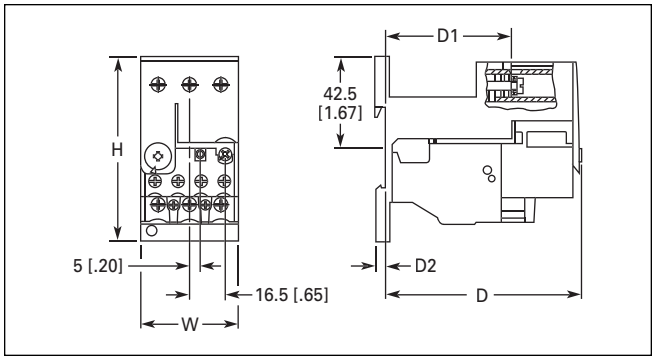


Figure 60. Frame B – C, XTOBXDINC DIN Rail or Panel Mount Adapter and Frame D, XTOBXDIND DIN Rail or Panel Mount Adapter — Approximate Dimensions in mm [in]

Table 117. XTOBXDINC, XTOBXDIND — Approximate Dimensions in mm [in]

	H	W	D	D1	D2
XTOB…CC1	85 [3.46]	45 [1.77]	90.5 [3.56]	58.3 [2.30]	3.8 [.15]
XTOB…DC1	86 [3.39]	60 [2.36]	112 [4.41]	80.5 [3.17]	4.7 [.19]

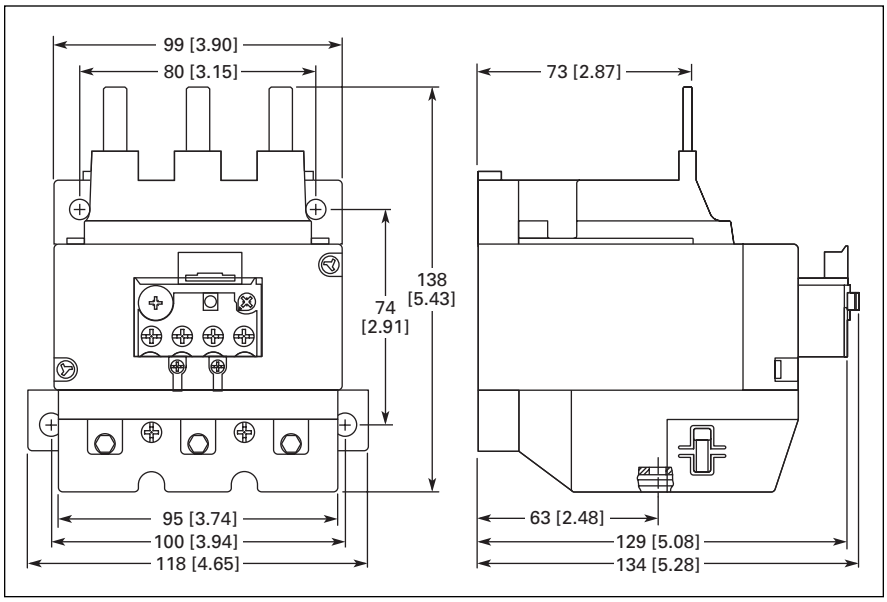


Figure 61. Frame F – G, XTOB…GC1 Overload Relay — Approximate Dimensions in mm [in]

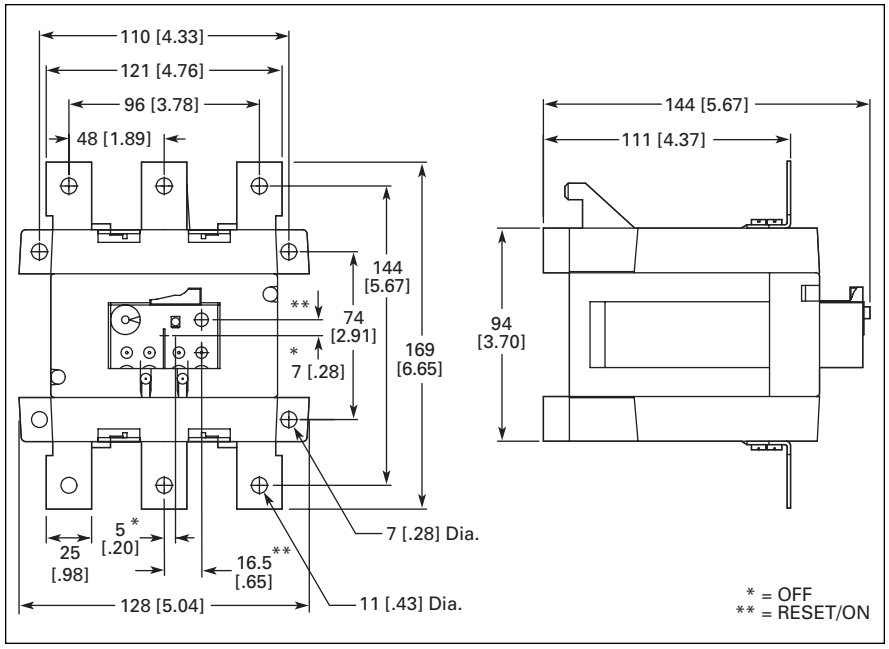


Figure 62. Frame L, XTOB…LC1 Overload Relay — Approximate Dimensions in mm [in]

Current Transformer Operated Overload Relay

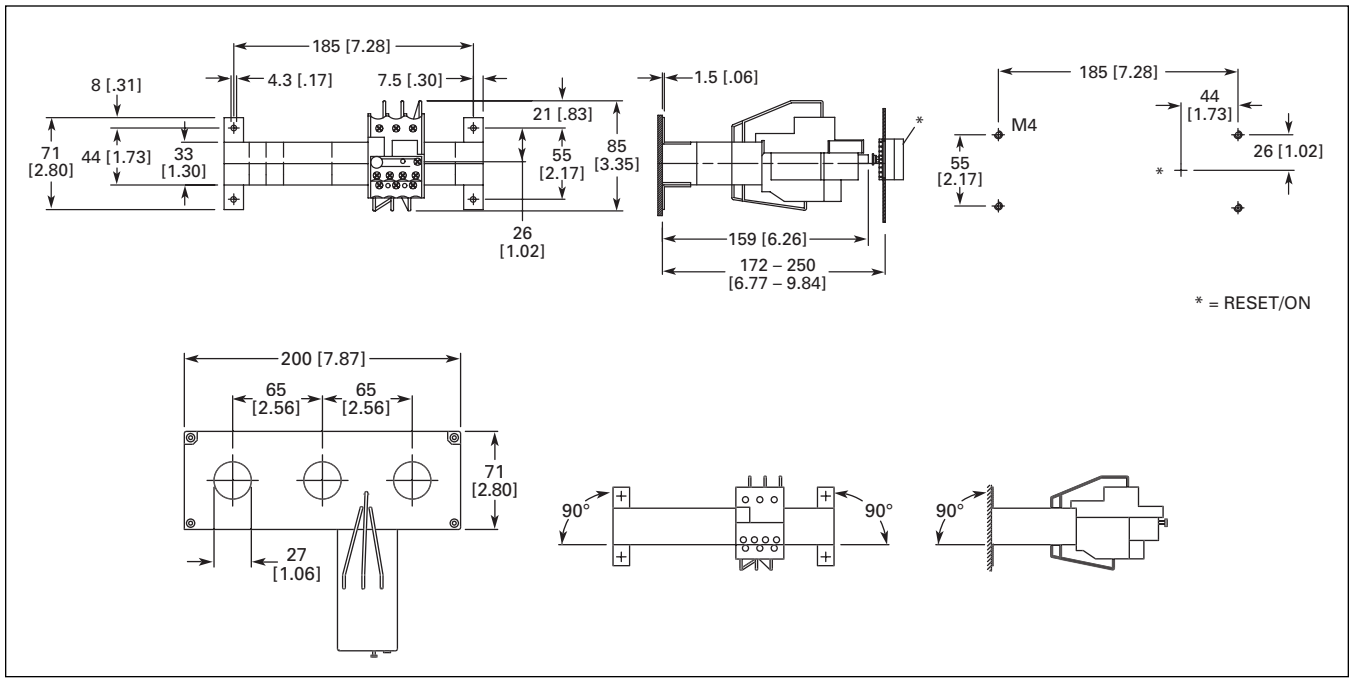


Figure 63. XTOT…C3S — Approximate Dimensions in mm [in]

Mechanical Interlock

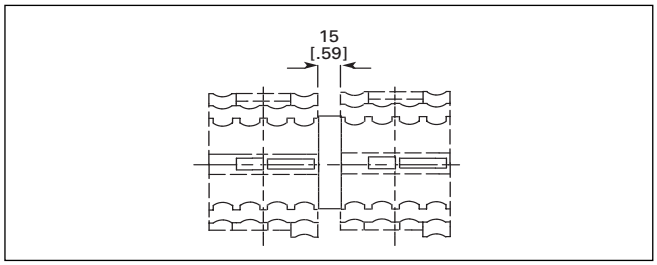


Figure 64. Frame L – M. XTCEXMLM Mechanical Interlock — Approximate Dimensions in mm [in]

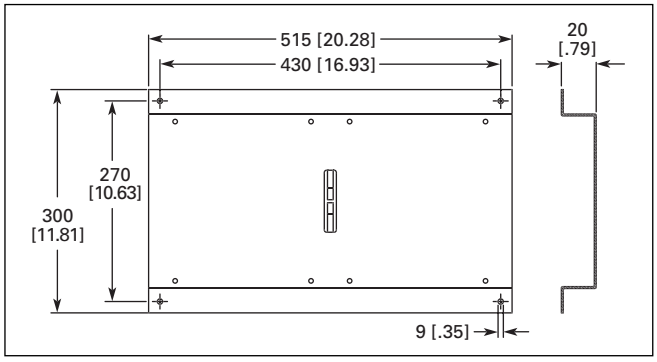


Figure 65. XTCEXMLN — Approximate Dimensions in mm [in]

Contactor with Terminal Shroud

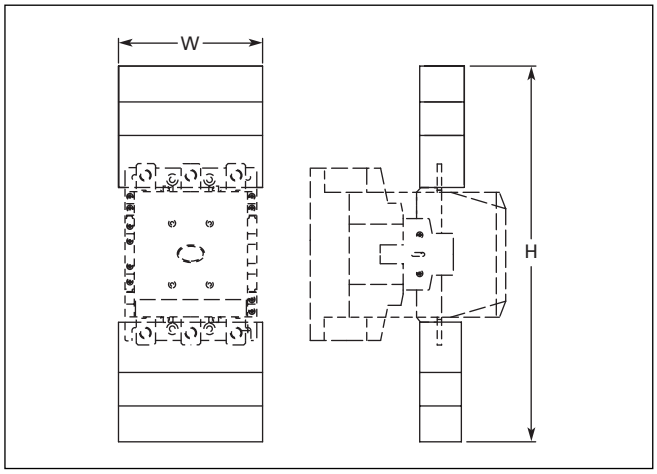


Figure 66. Frame L – N Contactors, XTCE185L – XTCEC10N, with Terminal Shroud XTLEXTS — Approximate Dimensions in mm [in]

Table 118. Frame L – N Contactors, XTCE185L – XTCEC10N, with Terminal Shroud XTLEXTS — Approximate Dimensions in mm [in]

XTCE185L, XTCE225L, XTCE250L		XTCE300M, XTCE400M		XTCE500M		XTCE580N, XTCE650N, XTCE750N, XTCE820N, XTCEC10N	
W	H	W	H	W	H	W	H
150 [5.91]	384 [15.12]	150 [5.91]	404 [15.91]	174 [6.85]	426 [16.77]	236 [9.29]	506 [19.92]

Suppressor

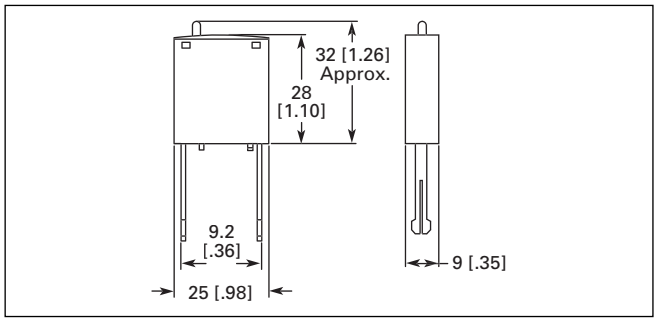


Figure 67. Suppressor — Approximate Dimensions in mm [in]

Cable Terminal Block

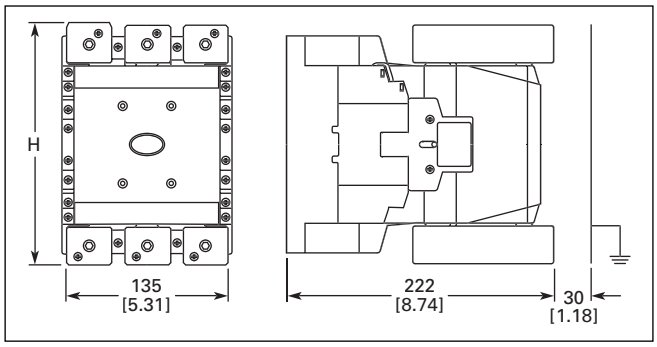


Figure 68. XTCEXTLA — Approximate Dimensions in mm [in]

Table 119. XTCEXTLA — Approximate Dimensions in mm [in]

XTCE185L – XTCE250L	XTCE300M – XTCE400M
198 [7.80]	218 [8.58]

Flat Strip Conductor Terminals

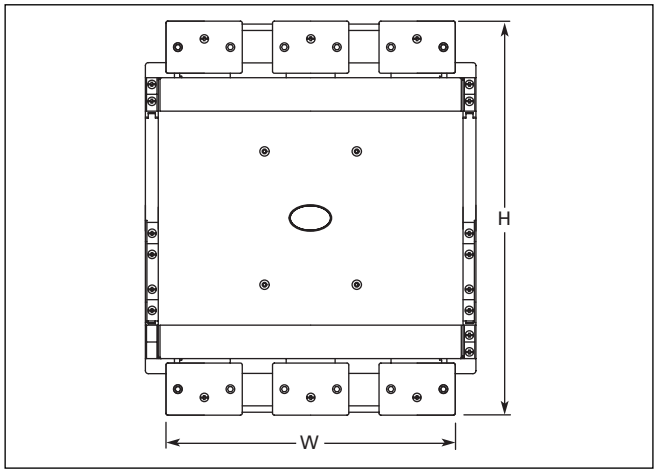


Figure 69. XTCEXTFB — Approximate Dimensions in mm [in]

Table 120. XTCEXTFB — Approximate Dimensions in mm [in]

	W	H
XTCE500M	171 [6.73]	232 [9.13]
XTCE580N – XTCE650N	218 [8.58]	295 [11.61]
XTCE750N – XTCE820N	231 [9.09]	310 [12.20]

Contents

Description	*Page*
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Catalog Number Selection	**90**
Product Selection	**91**
Wiring Diagrams	**113**
Dimensions	**116**
Modification Codes	**117**

ECX Enclosed Control

Product Description

The Cutler-Hammer® XT Line from Eaton's electrical business includes IEC Contactors, Starters and Combination Motor Controllers (CMCs). Designed to meet International Standards, the Enclosed Control XT Line (ECX), carries CE, UL and cUL certifications to support the IEC and NEMA markets.

Features and Benefits

- AC control from 12V to 600V 50/60 Hz
- DC control from 12V to 220V
- Available with screw or spring cage terminals
- Reversing or non-reversing contactors and starters
- AC-3 contactor ratings to 1000A and AC-1 contactor ratings to 2000A
- Non-reversing starters to 650A
- Panel or DIN rail mounting to 65A
- IP20 finger and back-of-hand proof
- Large ambient temperature range, -25 to 50°C [-13 to 122°F]
- AC and DC controlled contactors in the same compact frame
- Low power consumption DC coils
- Built-in NO or NC auxiliary contacts to 32A
- Plug-in accessories for reduced installation time
- Nonmetallic and metallic enclosures in Types 1 (IP23), 4 (IP66), 4X (IP66) and 12 (IP65)
- Circuit breakers, North American or European fuses available
- Opaque (standard) or clear covers available on nonmetallic Halyester enclosure)

Standards and Certifications

- Fusible — with Class J fuses
  - ❑ UL Listed
  - ❑ cUL Listed ①
- Fusible — with Class gG fuses
  - ❑ CE Marked
- Circuit Breaker HMCPE
  - ❑ UL Listed
  - ❑ cUL Listed ①
  - ❑ CE Marked

① cUL Listing indicates appropriate CSA standard investigation.

Cover Control

Non-combination Starters

Current Power Transformer (CPT) may be required.

Combination Starters

- Cover control for Combination Starters uses E22 style (22 mm).
- Selector switches are maintained with lever operators.
- Pushbuttons are momentary type with extended pushbutton.
- The kit includes hardware and connecting wires (where possible).
- For factory installed control devices other than shown below, refer to Modification Codes, **Page 117**.

E22 Selector Switch

Table 121. Combination Starter Cover Control

Description	Factory Installed ②		Field Kits	
	Position 9 Cover Control Code	Combination Only Adder	Catalog Number	Price
Kits for Non-reversing				
No Cover Mounted Pilot Devices	**A**	N/C	**—**	
START/STOP Pushbuttons (PB)	**B**	.	**CE400T01**	
START/STOP PB & Red RUN Light	**C**	.	**CE400T02** ③	
START/STOP PB, Red RUN, & Green STOPPED Light	**D**		**CE400T03** ③	
HAND/OFF/AUTO Selector Switch (SS)	**H**	.	**CE400T04**	
H-O-A SS & Red RUN Light	**J**		**CE400T05** ③	
H-O-A SS, Red RUN, & Green STOPPED Light	**K**		**CE400T06** ③	
Red RUN Pilot Light	**P**		**CE400T10** ③	
Green Off Pilot Light	**Q**	.	**CE400T11** ③	
Red RUN/Green OFF Pilot Light	**R**		**CE400T12** ③	
ON/OFF Selector Switch (SS)	**S**		**CE400T07**	
ON/OFF SS, Red RUN Light	**T**		**CE400T08** ③	
ON/OFF SS, Red RUN, & Green STOPPED Light	**U**		**CE400T09** ③	
Kits for Full Voltage Reversing				
No Cover Mounted Pilot Devices	**A**	N/C	**—**	
FWD/REV/STOP Pushbuttons (PB)	**B**		**CE400T50**	
FWD/REV/STOP PB + Red FWD & REV Lights	**C**		**CE400T51** ③	
FWD/REV/STOP PB, Red FWD/REV, & Green STOPPED	**D**		**CE400T52** ③	
FOR/OFF/REV Selector Switch (SS)	**H**		**CE400T53**	
FOR/OFF/REV SS + Red FWD & REV Lights	**J**		**CE400T54** ③	
FOR/OFF/REV SS, Red FWD/REV, & Green STOPPED	**K**		**CE400T55** ③	
OPEN/OFF/CLOSE Selector Switch (SS)	**V**		**CE400T56**	
OPEN/OFF/CLOSE SS + Red FWD & REV Lights	**W**		**CE400T57** ③	
OPEN/OFF/CLOSE SS, Red FWD/REV, & Green STOPPED	**X**		**CE400T58** ③	

② To include any of the above cover controls, place the control code character in position 9 of your Catalog Number. Example: EXE09B4A**D**A_. Full voltage non-reversing fusible starter with START/STOP pushbutton with red RUN and green OFF pilot lights.

③ Suffix for lights (required for field installed kits only) in chart below:

Rating	Catalog Suffix	Rating	Catalog Suffix
120V 60 Hz	**A**	277V 60 Hz	**H**
208V 60 Hz	**E**	380V 50 Hz	**L**
240V 60 Hz	**B**	460V 60 Hz	**C**
		600V 60 Hz	**D**

Discount Symbol **MC7**

Catalog Number Selection

Table 122. IEC XT Line Enclosed Control Catalog Numbering System

EC X 25 E 5 A A A - _ _

Design
X = XT IEC

Modification Codes
(See **Page 117**)

Overload Range
(See **Table 123**)

Class		Page
09 =	FVNR Starters — Non-combination	**91**
10 =	FVR Starters — Non-combination	**93**
11 =	FVNR Starters with CPT — Non-combination	**95**
19 =	FVNR Combination with Fused Disconnect	**97**
20 =	FVR Combination with Fused Disconnect	**101**
25 =	FVNR Combination with HMCP/E	**105**
26 =	FVR Combination with HMCP/E	**109**

Disconnect Fuse Clip Ratings

A =	None
C =	30A J
D =	30A gG
E =	60A J
F =	60A gG
G =	100A J
H =	100A gG

HMCPE Ratings

A =	None
B =	3A
C =	7A
D =	15A
E =	30A
F =	50A
W =	70A
G =	100A
H =	150A
J =	250A

Frame Size

Combination (Class 16 – 74)	Non-combination (Class 09 – 11) Ampere Rating (UL 600V)	
IEC Size **B** – **L**	**B** = 7A	**G** = 25A
	C = 9A	**H** = 32A
	D = 12A	**J** = 40A
	E = 15A	**K** = 50A
	F = 18A	**L** = 65A

Enclosure Type/IP Ratings ①
1 = Type 1— General Purpose/IP23
3 = Type 4 — Painted Steel/IP66
4 = Type 4X — Watertight (304-Grade Stainless Steel)/IP66
5 = Type 4X - Watertight (Non-metallic)/IP66
8 = Type 12 — Dust-Tight/IP65

Cover Control
(See **Page 89**)

Coil Voltage

A =	120V	**H** =	277V
B =	240V	**L** =	380V/50 Hz
C =	480V	**Q** =	24V DC
D =	600V	**T** =	24V AC
E =	208V		

① See **Table 234** on **Page 184** for Enclosure Type/IP Rating Cross-Reference.

Table 123. XTOB Overload Relays

FLA Ratings	B – D Frames 12A	E – H Frames 32A	J – L Frames 65A
0.1 – 0.16	**A**	**A**	—
0.16 – 0.24	**B**	**B**	—
0.24 – 0.4	**C**	**C**	—
0.4 – 0.6	**D**	**D**	—
0.6 – 1	**E**	**E**	—
1 – 1.6	**F**	**F**	—
1.6 – 2.4	**G**	**G**	—
2.4 – 4	**H**	**H**	—
4 – 6	**I**	**I**	—
6 – 10	**J**	**J**	**J**
9 – 12	**K**	—	—
10 – 16	—	**L**	**L**
16 – 24	—	**M**	**M**
24 – 32	—	**N**	**N**
24 – 40	—	—	**P**
40 – 57	—	—	**Q**
50 – 65	—	—	**R**

Table 124. Class 09 — XT FVNR Starters — Non-combination (Type 1 and Type 4X)

Size	Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Type 1/IP23		Type 4X/IP66 ④		Component
		Motor Voltage ⑤	1-Phase	3-Phase		Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
B	7	115	1/4	—	120	ECX09B1AAA-_		ECX09B4AAA-_		XTAE007B10A_
		200	3/4	1-1/2	208	ECX09B1EAA-_		ECX09B4EAA-_		XTAE007B10E_
		230	1	2 (2.2)	240	ECX09B1BAA-_		ECX09B4BAA-_		XTAE007B10B_
		380	—	3 (3)	380/50 Hz	ECX09B1LAA-_		ECX09B4LAA-_		XTAE007B10L_
		460	—	3	480	ECX09B1CAA-_		ECX09B4CAA-_		XTAE007B10C_
		575	—	5	600	ECX09B1DAA-_		ECX09B4DAA-_		XTAE007B10D_
C	9	115	1/2	—	120	ECX09C1AAA-_		ECX09C4AAA-_		XTAE009B10A_
		200	1	3	208	ECX09C1EAA-_		ECX09C4EAA-_		XTAE009B10E_
		230	1-1/2	3 (2.5)	240	ECX09C1CAA-_		ECX09C4CAA-_		XTAE009B10B_
		380	—	4 (4)	380/50 Hz	ECX09C1LAA-_		ECX09C4LAA-_		XTAE009B10L_
		460	—	5	480	ECX09C1CAA-_		ECX09C4CAA-_		XTAE009B10C_
		575	—	7-1/2	600	ECX09C1DAA-_		ECX09C4DAA-_		XTAE009B10D_
D	12	115	1	—	120	ECX09D1AAA-_		ECX09D4AAA-_		XTAE012D10A_
		200	2	3	208	ECX09D1EAA-_		ECX09D4EAA-_		XTAE012D10E_
		230	2	3 (3.5)	240	ECX09D1BAA-_		ECX09D4BAA-_		XTAE012D10B_
		380	—	5 (5.5)	380/50 Hz	ECX09D1LAA-_		ECX09D4LAA-_		XTAE012D10L_
		460	—	10	480	ECX09D1CAA-_		ECX09D4CAA-_		XTAE012D10C_
		575	—	10	600	ECX09D1DAA-_		ECX09D4DAA-_		XTAE012D10D_
E	15	115	1	—	120	ECX09E1AAA-_		ECX09E4AAA-_		XTAE015B10A_
		200	2	5	208	ECX09E1EAA-_		ECX09E4EAA-_		XTAE015B10E_
		230	3	5 (5)	240	ECX09E1BAA-_		ECX09E4BAA-_		XTAE015B10B_
		380	—	5 (7.5)	380/50 Hz	ECX09E1LAA-_		ECX09E4LAA-_		XTAE015B10L_
		460	—	10	480	ECX09E1CAA-_		ECX09E4CAA-_		XTAE015B10C_
		575	—	10	600	ECX09E1DAA-_		ECX09E4DAA-_		XTAE015B10D_
F	18	115	2	—	120	ECX09F1AAA-_		ECX09F4AAA-_		XTAE018B10A_
		200	2	5	208	ECX09F1EAA-_		ECX09F4EAA-_		XTAE018B10E_
		230	3	5 (5)	240	ECX09F1BAA-_		ECX09F4BAA-_		XTAE018B10B_
		380	—	7-1/2 (5)	380/50 Hz	ECX09F1LAA-_		ECX09F4LAA-_		XTAE018B10L_
		460	—	10	480	ECX09F1CAA-_		ECX09F4CAA-_		XTAE018B10C_
		575	—	15	600	ECX09F1DAA-_		ECX09F4DAA-_		XTAE018B10D_
G	25	115	2	—	120	ECX09G1AAA-_		ECX09G4AAA-_		XTAE025B10A_
		200	3	7-1/2	208	ECX09G1EAA-_		ECX09G4EAA-_		XTAE025B10E_
		230	5	7-1/2 (7.5)	240	ECX09G1BAA-_		ECX09G4BAA-_		XTAE025B10B_
		380	—	10 (10)	380/50 Hz	ECX09G1LAA-_		ECX09G4LAA-_		XTAE025B10L_
		460	—	15	480	ECX09G1CAA-_		ECX09G4CAA-_		XTAE025B10C_
		575	—	20	600	ECX09G1DAA-_		ECX09G4DAA-_		XTAE025B10D_
H	32	115	3	—	120	ECX09H1AAA-_		ECX09H4AAA-_		XTAE032B10A_
		200	5	10	208	ECX09H1EAA-_		ECX09H4EAA-_		XTAE032B10E_
		230	5	10 (10)	240	ECX09H1BAA-_		ECX09H4BAA-_		XTAE032B10B_
		380	—	15 (15)	380/50 Hz	ECX09H1LAA-_		ECX09H4LAA-_		XTAE032B10L_
		460	—	20	480	ECX09H1CAA-_		ECX09H4CAA-_		XTAE032B10C_
		575	—	25	600	ECX09H1DAA-_		ECX09H4DAA-_		XTAE032B10D_
J	40	115	3	—	120	ECX09J1AAA-_		ECX09J4AAA-_		XTAE040B00A_
		200	5	10	208	ECX09J1EAA-_		ECX09J4EAA-_		XTAE040B00E_
		230	7-1/2	15 (12.5)	240	ECX09J1BAA-_		ECX09J4BAA-_		XTAE040B00B_
		380	—	15 (17.5)	380/50 Hz	ECX09J1LAA-_		ECX09J4LAA-_		XTAE040B00L_
		460	—	30	480	ECX09J1CAA-_		ECX09J4CAA-_		XTAE040B00C_
		575	—	40	600	ECX09J1DAA-_		ECX09J4DAA-_		XTAE040B00D_
K	50	115	3	—	120	ECX09K1AAA-_		ECX09K4AAA-_		XTAE050B00A_
		200	7-1/2	15	208	ECX09K1EAA-_		ECX09K4EAA-_		XTAE050B00E_
		230	10	20 (15.5)	240	ECX09K1BAA-_		ECX09K4BAA-_		XTAE050B00B_
		380	—	20 (22)	380/50 Hz	ECX09K1LAA-_		ECX09K4LAA-_		XTAE050B00L_
		460	—	40	480	ECX09K1CAA-_		ECX09K4CAA-_		XTAE050B00C_
		575	—	50	600	ECX09K1DAA-_		ECX09K4DAA-_		XTAE050B00D_
L	65	115	5	—	120	ECX09L1AAA-_		ECX09L4AAA-_		XTAE065B00A_
		200	10	20	208	ECX09L1EAA-_		ECX09L4EAA-_		XTAE065B00E_
		230	15	25 (20)	240	ECX09L1BAA-_		ECX09L4BAA-_		XTAE065B00B_
		380	—	30 (30)	380/50 Hz	ECX09L1LAA-_		ECX09L4LAA-_		XTAE065B00L_
		460	—	50	480	ECX09L1CAA-_		ECX09L4CAA-_		XTAE065B00C_
		575	—	60	600	ECX09L1DAA-_		ECX09L4DAA-_		XTAE065B00D_

① 1 hp = 1.014 kW.

② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.

③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX09B**4**AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.

⑤ Contact factory for other voltage options.

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Table 125. Class 09 — XT FVNR Starters — Non-combination (Type 4X Nonmetallic and Type 12)

Size	Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
		Motor Voltage ④	1-Phase	3-Phase		Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
B	7	115	1/4	—	120	ECX09B5AAA-_		ECX09B8AAA-_		XTAE007B10A_
		200	3/4	1-1/2	208	ECX09B5EAA-_		ECX09B8EAA-_		XTAE007B10E_
		230	1	2 (2.2)	240	ECX09B5BAA-_		ECX09B8BAA-_		XTAE007B10B_
		380	—	3 (3)	380/50 Hz	ECX09B5LAA-_		ECX09B8LAA-_		XTAE007B10L_
		460	—	3	480	ECX09B5CAA-_		ECX09B8CAA-_		XTAE007B10C_
		575	—	5	600	ECX09B5DAA-_		ECX09B8DAA-_		XTAE007B10D_
C	9	115	1/2	—	120	ECX09C5AAA-_		ECX09C8AAA-_		XTAE009B10A_
		200	1	3	208	ECX09C5EAA-_		ECX09C8EAA-_		XTAE009B10E_
		230	1-1/2	3 (2.5)	240	ECX09C5CAA-_		ECX09C8CAA-_		XTAE009B10B_
		380	—	4 (4)	380/50 Hz	ECX09C5LAA-_		ECX09C8LAA-_		XTAE009B10L_
		460	—	5	480	ECX09C5CAA-_		ECX09C8CAA-_		XTAE009B10C_
		575	—	7-1/2	600	ECX09C5DAA-_		ECX09C8DAA-_		XTAE009B10D_
D	12	115	1	—	120	ECX09D5AAA-_		ECX09D8AAA-_		XTAE012B10A_
		200	2	3	208	ECX09D5EAA-_		ECX09D8EAA-_		XTAE012B10E_
		230	2	3 (3.5)	240	ECX09D5BAA-_		ECX09D8BAA-_		XTAE012B10B_
		380	—	5 (5.5)	380/50 Hz	ECX09D5LAA-_		ECX09D8LAA-_		XTAE012B10L_
		460	—	10	480	ECX09D5CAA-_		ECX09D8CAA-_		XTAE012B10C_
		575	—	10	600	ECX09D5DAA-_		ECX09D8DAA-_		XTAE012B10D_
E	15	115	1	—	120	ECX09E5AAA-_		ECX09E8AAA-_		XTAE015B10A_
		200	2	5	208	ECX09E5EAA-_		ECX09E8EAA-_		XTAE015B10E_
		230	3	5 (5)	240	ECX09E5BAA-_		ECX09E8BAA-_		XTAE015B10B_
		380	—	5 (7.5)	380/50 Hz	ECX09E5LAA-_		ECX09E8LAA-_		XTAE015B10L_
		460	—	10	480	ECX09E5CAA-_		ECX09E8CAA-_		XTAE015B10C_
		575	—	10	600	ECX09E5DAA-_		ECX09E8DAA-_		XTAE015B10D_
F	18	115	2	—	120	ECX09F5AAA-_		ECX09F8AAA-_		XTAE018B10A_
		200	2	5	208	ECX09F5EAA-_		ECX09F8EAA-_		XTAE018B10E_
		230	3	5 (5)	240	ECX09F5BAA-_		ECX09F8BAA-_		XTAE018B10B_
		380	—	7-1/2 (5)	380/50 Hz	ECX09F5LAA-_		ECX09F8LAA-_		XTAE018B10L_
		460	—	10	480	ECX09F5CAA-_		ECX09F8CAA-_		XTAE018B10C_
		575	—	15	600	ECX09F5DAA-_		ECX09F8DAA-_		XTAE018B10D_
G	25	115	2	—	120	ECX09G5AAA-_		ECX09G8AAA-_		XTAE025B10A_
		200	3	7-1/2	208	ECX09G5EAA-_		ECX09G8EAA-_		XTAE025B10E_
		230	5	7-1/2 (7.5)	240	ECX09G5BAA-_		ECX09G8BAA-_		XTAE025B10B_
		380	—	10 (10)	380/50 Hz	ECX09G5LAA-_		ECX09G8LAA-_		XTAE025B10L_
		460	—	15	480	ECX09G5CAA-_		ECX09G8CAA-_		XTAE025B10C_
		575	—	20	600	ECX09G5DAA-_		ECX09G8DAA-_		XTAE025B10D_
H	32	115	3	—	120	ECX09H5AAA-_		ECX09H8AAA-_		XTAE032B10A_
		200	5	10	208	ECX09H5EAA-_		ECX09H8EAA-_		XTAE032B10E_
		230	5	10 (10)	240	ECX09H5BAA-_		ECX09H8BAA-_		XTAE032B10B_
		380	—	15 (15)	380/50 Hz	ECX09H5LAA-_		ECX09H8LAA-_		XTAE032B10L_
		460	—	20	480	ECX09H5CAA-_		ECX09H8CAA-_		XTAE032B10C_
		575	—	25	600	ECX09H5DAA-_		ECX09H8DAA-_		XTAE032B10D_
J	40	115	3	—	120	ECX09J5AAA-_		ECX09J8AAA-_		XTAE040B00A_
		200	5	10	208	ECX09J5EAA-_		ECX09J8EAA-_		XTAE040B00E_
		230	7-1/2	15 (12.5)	240	ECX09J5BAA-_		ECX09J8BAA-_		XTAE040B00B_
		380	—	15 (17.5)	380/50 Hz	ECX09J5LAA-_		ECX09J8LAA-_		XTAE040B00L_
		460	—	30	480	ECX09J5CAA-_		ECX09J8CAA-_		XTAE040B00C_
		575	—	40	600	ECX09J5DAA-_		ECX09J8DAA-_		XTAE040B00D_
K	50	115	3	—	120	ECX09K5AAA-_		ECX09K8AAA-_		XTAE050B00A_
		200	7-1/2	15	208	ECX09K5EAA-_		ECX09K8EAA-_		XTAE050B00E_
		230	10	20 (15.5)	240	ECX09K5BAA-_		ECX09K8BAA-_		XTAE050B00B_
		380	—	20 (22)	380/50 Hz	ECX09K5LAA-_		ECX09K8LAA-_		XTAE050B00L_
		460	—	40	480	ECX09K5CAA-_		ECX09K8CAA-_		XTAE050B00C_
		575	—	50	600	ECX09K5DAA-_		ECX09K8DAA-_		XTAE050B00D_
L	65	115	5	—	120	ECX09L5AAA-_		ECX09L8AAA-_		XTAE065B00A_
		200	10	20	208	ECX09L5EAA-_		ECX09L8EAA-_		XTAE065B00E_
		230	15	25 (20)	240	ECX09L5BAA-_		ECX09L8BAA-_		XTAE065B00B_
		380	—	30 (30)	380/50 Hz	ECX09L5LAA-_		ECX09L8LAA-_		XTAE065B00L_
		460	—	50	480	ECX09L5CAA-_		ECX09L8CAA-_		XTAE065B00C_
		575	—	60	600	ECX09L5DAA-_		ECX09L8DAA-_		XTAE065B00D_

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ Contact factory for other voltage options.

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Table 126. Class 10 — XT FVR Starters — Non-combination (Type 1 and Type 4X)

Size	Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Type 1/IP23		Type 4X/IP66 ④		Component
		Motor Voltage ⑤	1-Phase	3-Phase		Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
B	7	115	1/4	—	120	ECX10B1AAA-_		ECX10B4AAA-_		XTAR007B21A_
		200	3/4	1-1/2	208	ECX10B1EAA-_		ECX10B4EAA-_		XTAR007B21E_
		230	1	2 (2.2)	240	ECX10B1BAA-_		ECX10B4BAA-_		XTAR007B21B_
		380	—	3 (3)	380/50 Hz	ECX10B1LAA-_		ECX10B4LAA-_		XTAR007B21L_
		460	—	3	480	ECX10B1CAA-_		ECX10B4CAA-_		XTAR007B21C_
		575	—	5	600	ECX10B1DAA-_		ECX10B4DAA-_		XTAR007B21D_
C	9	115	1/2	—	120	ECX10C1AAA-_		ECX10C4AAA-_		XTAR009B21A_
		200	1	3	208	ECX10C1EAA-_		ECX10C4EAA-_		XTAR009B21E_
		230	1-1/2	3 (2.5)	240	ECX10C1CAA-_		ECX10C4CAA-_		XTAR009B21B_
		380	—	4 (4)	380/50 Hz	ECX10C1LAA-_		ECX10C4LAA-_		XTAR009B21L_
		460	—	5	480	ECX10C1CAA-_		ECX10C4CAA-_		XTAR009B21C_
		575	—	7-1/2	600	ECX10C1DAA-_		ECX10C4DAA-_		XTAR009B21D_
D	12	115	1	—	120	ECX10D1AAA-_		ECX10D4AAA-_		XTAR012B21A_
		200	2	3	208	ECX10D1EAA-_		ECX10D4EAA-_		XTAR012B21E_
		230	2	3 (3.5)	240	ECX10D1BAA-_		ECX10D4BAA-_		XTAR012B21B_
		380	—	5 (5.5)	380/50 Hz	ECX10D1LAA-_		ECX10D4LAA-_		XTAR012B21L_
		460	—	10	480	ECX10D1CAA-_		ECX10D4CAA-_		XTAR012B21C_
		575	—	10	600	ECX10D1DAA-_		ECX10D4DAA-_		XTAR012B21D_
E	15	115	1	—	120	ECX10E1AAA-_		ECX10E4AAA-_		XTAR015B21A_
		200	2	5	208	ECX10E1EAA-_		ECX10E4EAA-_		XTAR015B21E_
		230	3	5 (5)	240	ECX10E1BAA-_		ECX10E4BAA-_		XTAR015B21B_
		380	—	5 (7.5)	380/50 Hz	ECX10E1LAA-_		ECX10E4LAA-_		XTAR015B21L_
		460	—	10	480	ECX10E1CAA-_		ECX10E4CAA-_		XTAR015B21C_
		575	—	10	600	ECX10E1DAA-_		ECX10E4DAA-_		XTAR015B21D_
F	18	115	2	—	120	ECX10F1AAA-_		ECX10F4AAA-_		XTAR018B21A_
		200	2	5	208	ECX10F1EAA-_		ECX10F4EAA-_		XTAR018B21E_
		230	3	5 (5)	240	ECX10F1BAA-_		ECX10F4BAA-_		XTAR018B21B_
		380	—	7-1/2 (5)	380/50 Hz	ECX10F1LAA-_		ECX10F4LAA-_		XTAR018B21L_
		460	—	10	480	ECX10F1CAA-_		ECX10F4CAA-_		XTAR018B21C_
		575	—	15	600	ECX10F1DAA-_		ECX10F4DAA-_		XTAR018B21D_
G	25	115	2	—	120	ECX10G1AAA-_		ECX10G4AAA-_		XTAR025B21A_
		200	3	7-1/2	208	ECX10G1EAA-_		ECX10G4EAA-_		XTAR025B21E_
		230	5	7-1/2 (7.5)	240	ECX10G1BAA-_		ECX10G4BAA-_		XTAR025B21B_
		380	—	10 (10)	380/50 Hz	ECX10G1LAA-_		ECX10G4LAA-_		XTAR025B21L_
		460	—	15	480	ECX10G1CAA-_		ECX10G4CAA-_		XTAR025B21C_
		575	—	20	600	ECX10G1DAA-_		ECX10G4DAA-_		XTAR025B21D_
H	32	115	3	—	120	ECX10H1AAA-_		ECX10H4AAA-_		XTAR032B21A_
		200	5	10	208	ECX10H1EAA-_		ECX10H4EAA-_		XTAR032B21E_
		230	5	10 (10)	240	ECX10H1BAA-_		ECX10H4BAA-_		XTAR032B21B_
		380	—	15 (15)	380/50 Hz	ECX10H1LAA-_		ECX10H4LAA-_		XTAR032B21L_
		460	—	20	480	ECX10H1CAA-_		ECX10H4CAA-_		XTAR032B21C_
		575	—	25	600	ECX10H1DAA-_		ECX10H4DAA-_		XTAR032B21D_
J	40	115	3	—	120	ECX10J1AAA-_		ECX10J4AAA-_		XTAR040B11A_
		200	5	10	208	ECX10J1EAA-_		ECX10J4EAA-_		XTAR040B11E_
		230	7-1/2	15 (12.5)	240	ECX10J1BAA-_		ECX10J4BAA-_		XTAR040B11B_
		380	—	15 (17.5)	380/50 Hz	ECX10J1LAA-_		ECX10J4LAA-_		XTAR040B11L_
		460	—	30	480	ECX10J1CAA-_		ECX10J4CAA-_		XTAR040B11C_
		575	—	40	600	ECX10J1DAA-_		ECX10J4DAA-_		XTAR040B11D_
K	50	115	3	—	120	ECX10K1AAA-_		ECX10K4AAA-_		XTAR050B11A_
		200	7-1/2	15	208	ECX10K1EAA-_		ECX10K4EAA-_		XTAR050B11E_
		230	10	20 (15.5)	240	ECX10K1BAA-_		ECX10K4BAA-_		XTAR050B11B_
		380	—	20 (22)	380/50 Hz	ECX10K1LAA-_		ECX10K4LAA-_		XTAR050B11L_
		460	—	40	480	ECX10K1CAA-_		ECX10K4CAA-_		XTAR050B11C_
		575	—	50	600	ECX10K1DAA-_		ECX10K4DAA-_		XTAR050B11D_
L	65	115	5	—	120	ECX10L1AAA-_		ECX10L4AAA-_		XTAR065B11A_
		200	10	20	208	ECX10L1EAA-_		ECX10L4EAA-_		XTAR065B11E_
		230	15	25 (20)	240	ECX10L1BAA-_		ECX10L4BAA-_		XTAR065B11B_
		380	—	30 (30)	380/50 Hz	ECX10L1LAA-_		ECX10L4LAA-_		XTAR065B11L_
		460	—	50	480	ECX10L1CAA-_		ECX10L4CAA-_		XTAR065B11C_
		575	—	60	600	ECX10L1DAA-_		ECX10L4DAA-_		XTAR065B11D_

① 1 hp = 1.014 kW.

② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.

③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX10B**4**AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.

⑤ Contact factory for other voltage options.

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Table 127. Class 10 — XT FVR Starters — Non-combination (Type 4X Nonmetallic and Type 12)

Size	Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
		Motor Voltage ④	1-Phase	3-Phase		Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
B	7	115	1/4	—	120	ECX10B5AAA-_		ECX10B8AAA-_		XTAR007B21A_
		200	3/4	1-1/2	208	ECX10B5EAA-_		ECX10B8EAA-_		XTAR007B21E_
		230	1	2 (2.2)	240	ECX10B5BAA-_		ECX10B8BAA-_		XTAR007B21B_
		380	—	3 (3)	380/50 Hz	ECX10B5LAA-_		ECX10B8LAA-_		XTAR007B21L_
		460	—	3	480	ECX10B5CAA-_		ECX10B8CAA-_		XTAR007B21C_
		575	—	5	600	ECX10B5DAA-_		ECX10B8DAA-_		XTAR007B21D_
C	9	115	1/2	—	120	ECX10C5AAA-_		ECX10C8AAA-_		XTAR009B21A_
		200	1	3	208	ECX10C5EAA-_		ECX10C8EAA-_		XTAR009B21E_
		230	1-1/2	3 (2.5)	240	ECX10C5CAA-_		ECX10C8CAA-_		XTAR009B21B_
		380	—	4 (4)	380/50 Hz	ECX10C5LAA-_		ECX10C8LAA-_		XTAR009B21L_
		460	—	5	480	ECX10C5CAA-_		ECX10C8CAA-_		XTAR009B21C_
		575	—	7-1/2	600	ECX10C5DAA-_		ECX10C8DAA-_		XTAR009B21D_
D	12	115	1	—	120	ECX10D5AAA-_		ECX10D8AAA-_		XTAR012B21A_
		200	2	3	208	ECX10D5EAA-_		ECX10D8EAA-_		XTAR012B21E_
		230	2	3 (3.5)	240	ECX10D5BAA-_		ECX10D8BAA-_		XTAR012B21B_
		380	—	5 (5.5)	380/50 Hz	ECX10D5LAA-_		ECX10D8LAA-_		XTAR012B21L_
		460	—	10	480	ECX10D5CAA-_		ECX10D8CAA-_		XTAR012B21C_
		575	—	10	600	ECX10D5DAA-_		ECX10D8DAA-_		XTAR012B21D_
E	15	115	1	—	120	ECX10E5AAA-_		ECX10E8AAA-_		XTAR015B21A_
		200	2	5	208	ECX10E5EAA-_		ECX10E8EAA-_		XTAR015B21E_
		230	3	5 (5)	240	ECX10E5BAA-_		ECX10E8BAA-_		XTAR015B21B_
		380	—	5 (7.5)	380/50 Hz	ECX10E5LAA-_		ECX10E8LAA-_		XTAR015B21L_
		460	—	10	480	ECX10E5CAA-_		ECX10E8CAA-_		XTAR015B21C_
		575	—	10	600	ECX10E5DAA-_		ECX10E8DAA-_		XTAR015B21D_
F	18	115	2	—	120	ECX10F5AAA-_		ECX10F8AAA-_		XTAR018B21A_
		200	2	5	208	ECX10F5EAA-_		ECX10F8EAA-_		XTAR018B21E_
		230	3	5 (5)	240	ECX10F5BAA-_		ECX10F8BAA-_		XTAR018B21B_
		380	—	7-1/2 (5)	380/50 Hz	ECX10F5LAA-_		ECX10F8LAA-_		XTAR018B21L_
		460	—	10	480	ECX10F5CAA-_		ECX10F8CAA-_		XTAR018B21C_
		575	—	15	600	ECX10F5DAA-_		ECX10F8DAA-_		XTAR018B21D_
G	25	115	2	—	120	ECX10G5AAA-_		ECX10G8AAA-_		XTAR025B21A_
		200	3	7-1/2	208	ECX10G5EAA-_		ECX10G8EAA-_		XTAR025B21E_
		230	5	7-1/2 (7.5)	240	ECX10G5BAA-_		ECX10G8BAA-_		XTAR025B21B_
		380	—	10 (10)	380/50 Hz	ECX10G5LAA-_		ECX10G8LAA-_		XTAR025B21L_
		460	—	15	480	ECX10G5CAA-_		ECX10G8CAA-_		XTAR025B21C_
		575	—	20	600	ECX10G5DAA-_		ECX10G8DAA-_		XTAR025B21D_
H	32	115	3	—	120	ECX10H5AAA-_		ECX10H8AAA-_		XTAR032B21A_
		200	5	10	208	ECX10H5EAA-_		ECX10H8EAA-_		XTAR032B21E_
		230	5	10 (10)	240	ECX10H5BAA-_		ECX10H8BAA-_		XTAR032B21B_
		380	—	15 (15)	380/50 Hz	ECX10H5LAA-_		ECX10H8LAA-_		XTAR032B21L_
		460	—	20	480	ECX10H5CAA-_		ECX10H8CAA-_		XTAR032B21C_
		575	—	25	600	ECX10H5DAA-_		ECX10H8DAA-_		XTAR032B21D_
J	40	115	3	—	120	ECX10J5AAA-_		ECX10J8AAA-_		XTAR040B11A_
		200	5	10	208	ECX10J5EAA-_		ECX10J8EAA-_		XTAR040B11E_
		230	7-1/2	15 (12.5)	240	ECX10J5BAA-_		ECX10J8BAA-_		XTAR040B11B_
		380	—	15 (17.5)	380/50 Hz	ECX10J5LAA-_		ECX10J8LAA-_		XTAR040B11L_
		460	—	30	480	ECX10J5CAA-_		ECX10J8CAA-_		XTAR040B11C_
		575	—	40	600	ECX10J5DAA-_		ECX10J8DAA-_		XTAR040B11D_
K	50	115	3	—	120	ECX10K5AAA-_		ECX10K8AAA-_		XTAR050B11A_
		200	7-1/2	15	208	ECX10K5EAA-_		ECX10K8EAA-_		XTAR050B11E_
		230	10	20 (15.5)	240	ECX10K5BAA-_		ECX10K8BAA-_		XTAR050B11B_
		380	—	20 (22)	380/50 Hz	ECX10K5LAA-_		ECX10K8LAA-_		XTAR050B11L_
		460	—	40	480	ECX10K5CAA-_		ECX10K8CAA-_		XTAR050B11C_
		575	—	50	600	ECX10K5DAA-_		ECX10K8DAA-_		XTAR050B11D_
L	65	115	5	—	120	ECX10L5AAA-_		ECX10L8AAA-_		XTAR065B11A_
		200	10	20	208	ECX10L5EAA-_		ECX10L8EAA-_		XTAR065B11E_
		230	15	25 (20)	240	ECX10L5BAA-_		ECX10L8BAA-_		XTAR065B11B_
		380	—	30 (30)	380/50 Hz	ECX10L5LAA-_		ECX10L8LAA-_		XTAR065B11L_
		460	—	50	480	ECX10L5CAA-_		ECX10L8CAA-_		XTAR065B11C_
		575	—	60	600	ECX10L5DAA-_		ECX10L8DAA-_		XTAR065B11D_

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ Contact factory for other voltage options.

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Table 128. Class 11 — XT FVNR Starters w/ CPT — Non-combination (Type 1 and Type 4X)

Size	Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Type 1/IP23		Type 4X/IP66 ④		Component
		Motor Voltage ⑤	1-Phase	3-Phase		Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
B	7	115	1/4	—	120	ECX11B1AAA-_		ECX11B4AAA-_		XTAE007B10A_
		200	3/4	1-1/2	208	ECX11B1EAA-_		ECX11B4EAA-_		XTAE007B10E_
		230	1	2 (2.2)	240	ECX11B1BAA-_		ECX11B4BAA-_		XTAE007B10B_
		380	—	3 (3)	380/50 Hz	ECX11B1LAA-_		ECX11B4LAA-_		XTAE007B10L_
		460	—	3	480	ECX11B1CAA-_		ECX11B4CAA-_		XTAE007B10C_
		575	—	5	600	ECX11B1DAA-_		ECX11B4DAA-_		XTAE007B10D_
C	9	115	1/2	—	120	ECX11C1AAA-_		ECX11C4AAA-_		XTAE009B10A_
		200	1	3	208	ECX11C1EAA-_		ECX11C4EAA-_		XTAE009B10E_
		230	1-1/2	3 (2.5)	240	ECX11C1CAA-_		ECX11C4CAA-_		XTAE009B10B_
		380	—	4 (4)	380/50 Hz	ECX11C1LAA-_		ECX11C4LAA-_		XTAE009B10L_
		460	—	5	480	ECX11C1CAA-_		ECX11C4CAA-_		XTAE009B10C_
		575	—	7-1/2	600	ECX11C1DAA-_		ECX11C4DAA-_		XTAE009B10D_
D	12	115	1	—	120	ECX11D1AAA-_		ECX11D4AAA-_		XTAE012B10A_
		200	2	3	208	ECX11D1EAA-_		ECX11D4EAA-_		XTAE012B10E_
		230	2	3 (3.5)	240	ECX11D1BAA-_		ECX11D4BAA-_		XTAE012B10B_
		380	—	5 (5.5)	380/50 Hz	ECX11D1LAA-_		ECX11D4LAA-_		XTAE012B10L_
		460	—	10	480	ECX11D1CAA-_		ECX11D4CAA-_		XTAE012B10C_
		575	—	10	600	ECX11D1DAA-_		ECX11D4DAA-_		XTAE012B10D_
E	15	115	1	—	120	ECX11E1AAA-_		ECX11E4AAA-_		XTAE015B10A_
		200	2	5	208	ECX11E1EAA-_		ECX11E4EAA-_		XTAE015B10E_
		230	3	5 (5)	240	ECX11E1BAA-_		ECX11E4BAA-_		XTAE015B10B_
		380	—	5 (7.5)	380/50 Hz	ECX11E1LAA-_		ECX11E4LAA-_		XTAE015B10L_
		460	—	10	480	ECX11E1CAA-_		ECX11E4CAA-_		XTAE015B10C_
		575	—	10	600	ECX11E1DAA-_		ECX11E4DAA-_		XTAE015B10D_
F	18	115	2	—	120	ECX11F1AAA-_		ECX11F4AAA-_		XTAE018B10A_
		200	2	5	208	ECX11F1EAA-_		ECX11F4EAA-_		XTAE018B10E_
		230	3	5 (5)	240	ECX11F1BAA-_		ECX11F4BAA-_		XTAE018B10B_
		380	—	7-1/2 (5)	380/50 Hz	ECX11F1LAA-_		ECX11F4LAA-_		XTAE018B10L_
		460	—	10	480	ECX11F1CAA-_		ECX11F4CAA-_		XTAE018B10C_
		575	—	15	600	ECX11F1DAA-_		ECX11F4DAA-_		XTAE018B10D_
G	25	115	2	—	120	ECX11G1AAA-_		ECX11G4AAA-_		XTAE025B10A_
		200	3	7-1/2	208	ECX11G1EAA-_		ECX11G4EAA-_		XTAE025B10E_
		230	5	7-1/2 (7.5)	240	ECX11G1BAA-_		ECX11G4BAA-_		XTAE025B10B_
		380	—	10 (10)	380/50 Hz	ECX11G1LAA-_		ECX11G4LAA-_		XTAE025B10L_
		460	—	15	480	ECX11G1CAA-_		ECX11G4CAA-_		XTAE025B10C_
		575	—	20	600	ECX11G1DAA-_		ECX11G4DAA-_		XTAE025B10D_
H	32	115	3	—	120	ECX11H1AAA-_		ECX11H4AAA-_		XTAE032B10A_
		200	5	10	208	ECX11H1EAA-_		ECX11H4EAA-_		XTAE032B10E_
		230	5	10 (10)	240	ECX11H1BAA-_		ECX11H4BAA-_		XTAE032B10B_
		380	—	15 (15)	380/50 Hz	ECX11H1LAA-_		ECX11H4LAA-_		XTAE032B10L_
		460	—	20	480	ECX11H1CAA-_		ECX11H4CAA-_		XTAE032B10C_
		575	—	25	600	ECX11H1DAA-_		ECX11H4DAA-_		XTAE032B10D_
J	40	115	3	—	120	ECX11J1AAA-_		ECX11J4AAA-_		XTAE040B00A_
		200	5	10	208	ECX11J1EAA-_		ECX11J4EAA-_		XTAE040B00E_
		230	7-1/2	15 (12.5)	240	ECX11J1BAA-_		ECX11J4BAA-_		XTAE040B00B_
		380	—	15 (17.5)	380/50 Hz	ECX11J1LAA-_		ECX11J4LAA-_		XTAE040B00L_
		460	—	30	480	ECX11J1CAA-_		ECX11J4CAA-_		XTAE040B00C_
		575	—	40	600	ECX11J1DAA-_		ECX11J4DAA-_		XTAE040B00D_
K	50	115	3	—	120	ECX11K1AAA-_		ECX11K4AAA-_		XTAE050B00A_
		200	7-1/2	15	208	ECX11K1EAA-_		ECX11K4EAA-_		XTAE050B00E_
		230	10	20 (15.5)	240	ECX11K1BAA-_		ECX11K4BAA-_		XTAE050B00B_
		380	—	20 (22)	380/50 Hz	ECX11K1LAA-_		ECX11K4LAA-_		XTAE050B00L_
		460	—	40	480	ECX11K1CAA-_		ECX11K4CAA-_		XTAE050B00C_
		575	—	50	600	ECX11K1DAA-_		ECX11K4DAA-_		XTAE050B00D_
L	65	115	5	—	120	ECX11L1AAA-_		ECX11L4AAA-_		XTAE065B00A_
		200	10	20	208	ECX11L1EAA-_		ECX11L4EAA-_		XTAE065B00E_
		230	15	25 (20)	240	ECX11L1BAA-_		ECX11L4BAA-_		XTAE065B00B_
		380	—	30 (30)	380/50 Hz	ECX11L1LAA-_		ECX11L4LAA-_		XTAE065B00L_
		460	—	50	480	ECX11L1CAA-_		ECX11L4CAA-_		XTAE065B00C_
		575	—	60	600	ECX11L1DAA-_		ECX11L4DAA-_		XTAE065B00D_

① 1 hp = 1.014 kW.

② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.

③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.

④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX11B**4**AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.

⑤ Contact factory for other voltage options.

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Table 129. Class 11 — XT FVNR Starters w/ CPT — Non-combination (Type 4X Nonmetallic and Type 12)

Size	Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
		Motor Voltage ④	1-Phase	3-Phase		Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
B	7	115	1/4	—	120	ECX11B5AAA-_		ECX11B8AAA-_		XTAE007B10A_
		200	3/4	1-1/2	208	ECX11B5EAA-_		ECX11B8EAA-_		XTAE007B10E_
		230	1	2 (2.2)	240	ECX11B5BAA-_		ECX11B8BAA-_		XTAE007B10B_
		380	—	3 (3)	380/50 Hz	ECX11B5LAA-_		ECX11B8LAA-_		XTAE007B10L_
		460	—	3	480	ECX11B5CAA-_		ECX11B8CAA-_		XTAE007B10C_
		575	—	5	600	ECX11B5DAA-_		ECX11B8DAA-_		XTAE007B10D_
C	9	115	1/2	—	120	ECX11C5AAA-_		ECX11C8AAA-_		XTAE009B10A_
		200	1	3	208	ECX11C5EAA-_		ECX11C8EAA-_		XTAE009B10E_
		230	1-1/2	3 (2.5)	240	ECX11C5CAA-_		ECX11C8CAA-_		XTAE009B10B_
		380	—	4 (4)	380/50 Hz	ECX11C5LAA-_		ECX11C8LAA-_		XTAE009B10L_
		460	—	5	480	ECX11C5CAA-_		ECX11C8CAA-_		XTAE009B10C_
		575	—	7-1/2	600	ECX11C5DAA-_		ECX11C8DAA-_		XTAE009B10D_
D	12	115	1	—	120	ECX11D5AAA-_		ECX11D8AAA-_		XTAE012B10A_
		200	2	3	208	ECX11D5EAA-_		ECX11D8EAA-_		XTAE012B10E_
		230	2	3 (3.5)	240	ECX11D5BAA-_		ECX11D8BAA-_		XTAE012B10B_
		380	—	5 (5.5)	380/50 Hz	ECX11D5LAA-_		ECX11D8LAA-_		XTAE012B10L_
		460	—	10	480	ECX11D5CAA-_		ECX11D8CAA-_		XTAE012B10C_
		575	—	10	600	ECX11D5DAA-_		ECX11D8DAA-_		XTAE012B10D_
E	15	115	1	—	120	ECX11E5AAA-_		ECX11E8AAA-_		XTAE015B10A_
		200	2	5	208	ECX11E5EAA-_		ECX11E8EAA-_		XTAE015B10E_
		230	3	5 (5)	240	ECX11E5BAA-_		ECX11E8BAA-_		XTAE015B10B_
		380	—	5 (7.5)	380/50 Hz	ECX11E5LAA-_		ECX11E8LAA-_		XTAE015B10L_
		460	—	10	480	ECX11E5CAA-_		ECX11E8CAA-_		XTAE015B10C_
		575	—	10	600	ECX11E5DAA-_		ECX11E8DAA-_		XTAE015B10D_
F	18	115	2	—	120	ECX11F5AAA-_		ECX11F8AAA-_		XTAE018B10A_
		200	2	5	208	ECX11F5EAA-_		ECX11F8EAA-_		XTAE018B10E_
		230	3	5 (5)	240	ECX11F5BAA-_		ECX11F8BAA-_		XTAE018B10B_
		380	—	7-1/2 (5)	380/50 Hz	ECX11F5LAA-_		ECX11F8LAA-_		XTAE018B10L_
		460	—	10	480	ECX11F5CAA-_		ECX11F8CAA-_		XTAE018B10C_
		575	—	15	600	ECX11F5DAA-_		ECX11F8DAA-_		XTAE018B10D_
G	25	115	2	—	120	ECX11G5AAA-_		ECX11G8AAA-_		XTAE025B10A_
		200	3	7-1/2	208	ECX11G5EAA-_		ECX11G8EAA-_		XTAE025B10E_
		230	5	7-1/2 (7.5)	240	ECX11G5BAA-_		ECX11G8BAA-_		XTAE025B10B_
		380	—	10 (10)	380/50 Hz	ECX11G5LAA-_		ECX11G8LAA-_		XTAE025B10L_
		460	—	15	480	ECX11G5CAA-_		ECX11G8CAA-_		XTAE025B10C_
		575	—	20	600	ECX11G5DAA-_		ECX11G8DAA-_		XTAE025B10D_
H	32	115	3	—	120	ECX11H5AAA-_		ECX11H8AAA-_		XTAE032B10A_
		200	5	10	208	ECX11H5EAA-_		ECX11H8EAA-_		XTAE032B10E_
		230	5	10 (10)	240	ECX11H5BAA-_		ECX11H8BAA-_		XTAE032B10B_
		380	—	15 (15)	380/50 Hz	ECX11H5LAA-_		ECX11H8LAA-_		XTAE032B10L_
		460	—	20	480	ECX11H5CAA-_		ECX11H8CAA-_		XTAE032B10C_
		575	—	25	600	ECX11H5DAA-_		ECX11H8DAA-_		XTAE032B10D_
J	40	115	3	—	120	ECX11J5AAA-_		ECX11J8AAA-_		XTAE040B00A_
		200	5	10	208	ECX11J5EAA-_		ECX11J8EAA-_		XTAE040B00E_
		230	7-1/2	15 (12.5)	240	ECX11J5BAA-_		ECX11J8BAA-_		XTAE040B00B_
		380	—	15 (17.5)	380/50 Hz	ECX11J5LAA-_		ECX11J8LAA-_		XTAE040B00L_
		460	—	30	480	ECX11J5CAA-_		ECX11J8CAA-_		XTAE040B00C_
		575	—	40	600	ECX11J5DAA-_		ECX11J8DAA-_		XTAE040B00D_
K	50	115	3	—	120	ECX11K5AAA-_		ECX11K8AAA-_		XTAE050B00A_
		200	7-1/2	15	208	ECX11K5EAA-_		ECX11K8EAA-_		XTAE050B00E_
		230	10	20 (15.5)	240	ECX11K5BAA-_		ECX11K8BAA-_		XTAE050B00B_
		380	—	20 (22)	380/50 Hz	ECX11K5LAA-_		ECX11K8LAA-_		XTAE050B00L_
		460	—	40	480	ECX11K5CAA-_		ECX11K8CAA-_		XTAE050B00C_
		575	—	50	600	ECX11K5DAA-_		ECX11K8DAA-_		XTAE050B00D_
L	65	115	5	—	120	ECX11L5AAA-_		ECX11L8AAA-_		XTAE065B00A_
		200	10	20	208	ECX11L5EAA-_		ECX11L8EAA-_		XTAE065B00E_
		230	15	25 (20)	240	ECX11L5BAA-_		ECX11L8BAA-_		XTAE065B00B_
		380	—	30 (30)	380/50 Hz	ECX11L5LAA-_		ECX11L8LAA-_		XTAE065B00L_
		460	—	50	480	ECX11L5CAA-_		ECX11L8CAA-_		XTAE065B00C_
		575	—	60	600	ECX11L5DAA-_		ECX11L8DAA-_		XTAE065B00D_

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ Contact factory for other voltage options.

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Table 130. Class 19 — XT FVNR Combination with Fused Disconnect (Type 1 and Type 4X) ③

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 1/IP23		Type 4X/IP66 ⑤		Component
	Motor Voltage ⑥	1-Phase	3-Phase			Catalog Number ④	Price	Catalog Number ④	Price	Catalog Number ④
Frame B										
7	—	—	—	—	30A	**ECX19B1AAA-_**		**ECX19B4AAA-_**		**XTAE007B10A_**
	115	1/4	—	120		**ECX19B1AAC-_**		**ECX19B4AAC-_**		**XTAE007B10A_**
	200	3/4	1-1/2	208		**ECX19B1EAC-_**		**ECX19B4EAC-_**		**XTAE007B10E_**
	230	1	2 (2.2)	240		**ECX19B1BAC-_**		**ECX19B4BAC-_**		**XTAE007B10B_**
	380	—	3 (3)	380/50 Hz		**ECX19B1LAC-_**		**ECX19B4LAC-_**		**XTAE007B10L_**
	460	—	3	480		**ECX19B1CAC-_**		**ECX19B4CAC-_**		**XTAE007B10C_**
	575	—	5	600		**ECX19B1DAC-_**		**ECX19B4DAC-_**		**XTAE007B10D_**
Frame C										
9	—	—	—	—	30A	**ECX19C1AAA-_**		**ECX19C4AAA-_**		**XTAE009B10A_**
	115	1/2	—	120		**ECX19C1AAC-_**		**ECX19C4AAC-_**		**XTAE009B10A_**
	200	1	3	208		**ECX19C1EAC-_**		**ECX19C4EAC-_**		**XTAE009B10E_**
	230	1-1/2	3 (2.5)	240		**ECX19C1CAC-_**		**ECX19C4CAC-_**		**XTAE009B10B_**
	380	—	4 (4)	380/50 Hz		**ECX19C1LAC-_**		**ECX19C4LAC-_**		**XTAE009B10L_**
	460	—	5	480		**ECX19C1CAC-_**		**ECX19C4CAC-_**		**XTAE009B10C_**
	575	—	7-1/2	600		**ECX19C1DAC-_**		**ECX19C4DAC-_**		**XTAE009B10D_**
Frame D										
12	—	—	—	—	30A	**ECX19D1AAA-_**		**ECX19D4AAA-_**		**XTAE012B10A_**
	115	1	—	120		**ECX19D1AAC-_**		**ECX19D4AAC-_**		**XTAE012B10A_**
	200	2	3	208		**ECX19D1EAC-_**		**ECX19D4EAC-_**		**XTAE012B10E_**
	230	2	3 (3.5)	240		**ECX19D1BAC-_**		**ECX19D4BAC-_**		**XTAE012B10B_**
	380	—	5 (5.5)	380/50 Hz		**ECX19D1LAC-_**		**ECX19D4LAC-_**		**XTAE012B10L_**
	460	—	10	480		**ECX19D1CAC-_**		**ECX19D4CAC-_**		**XTAE012B10C_**
	575	—	10	600		**ECX19D13DAC-_**		**ECX19D4DAC-_**		**XTAE012B10D_**
Frame E										
15	—	—	—	—	30A	**ECX19E1AAA-_**		**ECX19E4AAA-_**		**XTAE015B10A_**
	115	1	—	120		**ECX19E1AAC-_**		**ECX19E4AAC-_**		**XTAE015B10A_**
	200	2	5	208		**ECX19E1EAC-_**		**ECX19E4EAC-_**		**XTAE015B10E_**
	230	3	5 (5)	240		**ECX19E1BAC-_**		**ECX19E4BAC-_**		**XTAE015B10B_**
	380	—	5 (7.5)	380/50 Hz		**ECX19E1LAC-_**		**ECX19E4LAC-_**		**XTAE015B10L_**
	460	—	10	480		**ECX19E1CAC-_**		**ECX19E4CAC-_**		**XTAE015B10C_**
	575	—	10	600		**ECX19E1DAC-_**		**ECX19E4DAC-_**		**XTAE015B10D_**
Frame F										
18	—	—	—	—	30A	**ECX19F1AAA-_**		**ECX19F4AAA-_**		**XTAE018B10A_**
	115	2	—	120		**ECX19F1AAC-_**		**ECX19F4AAC-_**		**XTAE018B10A_**
	200	2	5	208		**ECX19F1EAC-_**		**ECX19F4EAC-_**		**XTAE018B10E_**
	230	3	5 (5)	240		**ECX19F1BAC-_**		**ECX19F4BAC-_**		**XTAE018B10B_**
	380	—	7-1/2 (5)	380/50 Hz		**ECX19F1LAC-_**		**ECX19F4LAC-_**		**XTAE018B10L_**
	460	—	10	480		**ECX19F1CAC-_**		**ECX19F4CAC-_**		**XTAE018B10C_**
	575	—	15	600		**ECX19F1DAC-_**		**ECX19F4DAC-_**		**XTAE018B10D_**
Frame G										
25	—	—	—	—	30A	**ECX19G1AAA-_**		**ECX19G4AAA-_**		**XTAE025B10A_**
	115	2	—	120		**ECX19G1AAC-_**		**ECX19G4AAC-_**		**XTAE025B10A_**
	200	3	7-1/2	208		**ECX19G1EAC-_**		**ECX19G4EAC-_**		**XTAE025B10E_**
	230	5	7-1/2 (7.5)	240		**ECX19G1BAC-_**		**ECX19G4BAC-_**		**XTAE025B10B_**
	380	—	10 (10)	380/50 Hz		**ECX19G1LAC-_**		**ECX19G4LAC-_**		**XTAE025B10L_**
	460	—	15	480		**ECX19G1CAC-_**		**ECX19G4CAC-_**		**XTAE025B10C_**
	575	—	20	600		**ECX19G1DAC-_**		**ECX19G4DAC-_**		**XTAE025B10D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ See Catalog Number Selection on **Page 90** to identify KEMA rated (gG) fuse blocks.
④ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
⑤ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX19B4AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.
⑥ Contact factory for other voltage options.

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Table 130. Class 19 — XT FVNR Combination with Fused Disconnect (Type 1 and Type 4X) (Continued) ③

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 1/IP23		Type 4X/IP66 ⑤		Component
	Motor Voltage ⑥	1-Phase	3-Phase			Catalog Number ④	Price	Catalog Number ④	Price	Catalog Number ④
Frame H										
32	—	—	—	—	60A	**ECX19H1AAA-_**		**ECX19H4AAA-_**		**XTAE032B10A_**
	115	3	—	120		**ECX19H1AAE-_**		**ECX19H4AAE-_**		**XTAE032B10A_**
	200	5	10	208		**ECX19H1EAE-_**		**ECX19H4EAE-_**		**XTAE032B10E_**
	230	5	10 (10)	240		**ECX19H1BAE-_**		**ECX19H4BAE-_**		**XTAE032B10B_**
	380	—	15 (15)	380/50 Hz		**ECX19H1LAE-_**		**ECX19H4LAE-_**		**XTAE032B10L_**
	460	—	20	480		**ECX19H1CAE-_**		**ECX19H4CAE-_**		**XTAE032B10C_**
	575	—	25	600		**ECX19H1DAE-_**		**ECX19H4DAE-_**		**XTAE032B10D_**
Frame J										
40	—	—	—	—	60A	**ECX19J1AAA-_**		**ECX19J4AAA-_**		**XTAE040B00A_**
	115	3	—	120		**ECX19J1AAE-_**		**ECX19J4AAE-_**		**XTAE040B00A_**
	200	5	10	208		**ECX19J1EAE-_**		**ECX19J4EAE-_**		**XTAE040B00E_**
	230	7-1/2	15 (12.5)	240		**ECX19J1BAE-_**		**ECX19J4BAE-_**		**XTAE040B00B_**
	380	—	15 (17.5)	380/50 Hz		**ECX19J1LAE-_**		**ECX19J4LAE-_**		**XTAE040B00L_**
	460	—	30	480		**ECX19J1CAE-_**		**ECX19J4CAE-_**		**XTAE040B00C_**
	575	—	40	600		**ECX19J1DAE-_**		**ECX19J4DAE-_**		**XTAE040B00D_**
Frame K										
50	—	—	—	—	60A	**ECX19K1AAA-_**		**ECX19K4AAA-_**		**XTAE050B00A_**
	115	3	—	120		**ECX19K1AAE-_**		**ECX19K4AAE-_**		**XTAE050B00A_**
	200	7-1/2	15	208		**ECX19K1EAE-_**		**ECX19K4EAE-_**		**XTAE050B00E_**
	230	10	20 (15.5)	240		**ECX19K1BAE-_**		**ECX19K4BAE-_**		**XTAE050B00B_**
	380	—	20 (22)	380/50 Hz		**ECX19K1LAE-_**		**ECX19K4LAE-_**		**XTAE050B00L_**
	460	—	40	480		**ECX19K1CAE-_**		**ECX19K4CAE-_**		**XTAE050B00C_**
	575	—	50	600		**ECX19K1DAE-_**		**ECX19K4DAE-_**		**XTAE050B00D_**
Frame L										
65	—	—	—	—	100A	**ECX19L1AAA-_**		**ECX19L4AAA-_**		**XTAE065B00A_**
	115	5	—	120		**ECX19L1AAG-_**		**ECX19L4AAG-_**		**XTAE065B00A_**
	200	10	20	208		**ECX19L1EAG-_**		**ECX19L4EAG-_**		**XTAE065B00E_**
	230	15	25 (20)	240		**ECX19L1BAG-_**		**ECX19L4BAG-_**		**XTAE065B00B_**
	380	—	30 (30)	380/50 Hz		**ECX19L1LAG-_**		**ECX19L4LAG-_**		**XTAE065B00L_**
	460	—	50	480		**ECX19L1CAG-_**		**ECX19L4CAG-_**		**XTAE065B00C_**
	575	—	60	600		**ECX19L1DAG-_**		**ECX19L4DAG-_**		**XTAE065B00D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ See Catalog Number Selection on **Page 90** to identify KEMA rated (gG) fuse blocks.
④ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
⑤ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX19B**4**AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.
⑥ Contact factory for other voltage options.

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Table 131. Class 19 — XT FVNR Combination with Fused Disconnect (Type 4X Nonmetallic and Type 12) ④

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame B										
7	—	—	—	—	30A	**ECX19B5AAA-_**		**ECX19B8AAA-_**		**XTAE007B10A_**
	115	1/4	—	120		**ECX19B5AAC-_**		**ECX19B8AAC-_**		**XTAE007B10A_**
	200	3/4	1-1/2	208		**ECX19B5EAC-_**		**ECX19B8EAC-_**		**XTAE007B10E_**
	230	1	2 (2.2)	240		**ECX19B5BAC-_**		**ECX19B8BAC-_**		**XTAE007B10B_**
	380	—	3 (3)	380/50 Hz		**ECX19B5LAC-_**		**ECX19B8LAC-_**		**XTAE007B10L_**
	460	—	3	480		**ECX19B5CAC-_**		**ECX19B8CAC-_**		**XTAE007B10C_**
	575	—	5	600		**ECX19B5DAC-_**		**ECX19B8DAC-_**		**XTAE007B10D_**
Frame C										
9	—	—	—	—	30A	**ECX19C5AAA-_**		**ECX19C8AAA-_**		**XTAE009B10A_**
	115	1/2	—	120		**ECX19C5AAC-_**		**ECX19C8AAC-_**		**XTAE009B10A_**
	200	1	3	208		**ECX19C5EAC-_**		**ECX19C8EAC-_**		**XTAE009B10E_**
	230	1-1/2	3 (2.5)	240		**ECX19C5CAC-_**		**ECX19C8CAC-_**		**XTAE009B10B_**
	380	—	4 (4)	380/50 Hz		**ECX19C5LAC-_**		**ECX19C8LAC-_**		**XTAE009B10L_**
	460	—	5	480		**ECX19C5CAC-_**		**ECX19C8CAC-_**		**XTAE009B10C_**
	575	—	7-1/2	600		**ECX19C5DAC-_**		**ECX19C8DAC-_**		**XTAE009B10D_**
Frame D										
12	—	—	—	—	30A	**ECX19D5AAA-_**		**ECX19D8AAA-_**		**XTAE012B10A_**
	115	1	—	120		**ECX19D5AAC-_**		**ECX19D8AAC-_**		**XTAE012B10A_**
	200	2	3	208		**ECX19D5EAC-_**		**ECX19D8EAC-_**		**XTAE012B10E_**
	230	2	3 (3.5)	240		**ECX19D5BAC-_**		**ECX19D8BAC-_**		**XTAE012B10B_**
	380	—	5 (5.5)	380/50 Hz		**ECX19D5LAC-_**		**ECX19D8LAC-_**		**XTAE012B10L_**
	460	—	10	480		**ECX19D5CAC-_**		**ECX19D8CAC-_**		**XTAE012B10C_**
	575	—	10	600		**ECX19D5DAC-_**		**ECX19D8DAC-_**		**XTAE012B10D_**
Frame E										
15	—	—	—	—	30A	**ECX19E5AAA-_**		**ECX19E8AAA-_**		**XTAE015B10A_**
	115	1	—	120		**ECX19E5AAC-_**		**ECX19E8AAC-_**		**XTAE015B10A_**
	200	2	5	208		**ECX19E5EAC-_**		**ECX19E8EAC-_**		**XTAE015B10E_**
	230	3	5 (5)	240		**ECX19E5BAC-_**		**ECX19E8BAC-_**		**XTAE015B10B_**
	380	—	5 (7.5)	380/50 Hz		**ECX19E5LAC-_**		**ECX19E8LAC-_**		**XTAE015B10L_**
	460	—	10	480		**ECX19E5CAC-_**		**ECX19E8CAC-_**		**XTAE015B10C_**
	575	—	10	600		**ECX19E5DAC-_**		**ECX19E8DAC-_**		**XTAE015B10D_**
Frame F										
18	—	—	—	—	30A	**ECX19F5AAA-_**		**ECX19F8AAA-_**		**XTAE018B10A_**
	115	2	—	120		**ECX19F5AAC-_**		**ECX19F8AAC-_**		**XTAE018B10A_**
	200	2	5	208		**ECX19F5EAC-_**		**ECX19F8EAC-_**		**XTAE018B10E_**
	230	3	5 (5)	240		**ECX19F5BAC-_**		**ECX19F8BAC-_**		**XTAE018B10B_**
	380	—	7-1/2 (5)	380/50 Hz		**ECX19F5LAC-_**		**ECX19F8LAC-_**		**XTAE018B10L_**
	460	—	10	480		**ECX19F5CAC-_**		**ECX19F8CAC-_**		**XTAE018B10C_**
	575	—	15	600		**ECX19F5DAC-_**		**ECX19F8DAC-_**		**XTAE018B10D_**
Frame G										
25	—	—	—	—	30A	**ECX19G5AAA-_**		**ECX19G8AAA-_**		**XTAE025B10A_**
	115	2	—	120		**ECX19G5AAC-_**		**ECX19G8AAC-_**		**XTAE025B10A_**
	200	3	7-1/2	208		**ECX19G5EAC-_**		**ECX19G8EAC-_**		**XTAE025B10E_**
	230	5	7-1/2 (7.5)	240		**ECX19G5BAC-_**		**ECX19G8BAC-_**		**XTAE025B10B_**
	380	—	10 (10)	380/50 Hz		**ECX19G5LAC-_**		**ECX19G8LAC-_**		**XTAE025B10L_**
	460	—	15	480		**ECX19G5CAC-_**		**ECX19G8CAC-_**		**XTAE025B10C_**
	575	—	20	600		**ECX19G5DAC-_**		**ECX19G8DAC-_**		**XTAE025B10D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ See Catalog Number Selection on **Page 90** to identify KEMA rated (gG) fuse blocks.
⑤ Contact factory for other voltage options.

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Table 131. Class 19 — XT FVNR Combination with Fused Disconnect (Type 4X Nonmetallic and Type 12) (Continued) ④

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame H										
32	—	—	—	—	60A	**ECX19H5AAA-_**		**ECX19H8AAA-_**		**XTAE032B10A_**
	115	3	—	120		**ECX19H5AAE-_**		**ECX19H8AAE-_**		**XTAE032B10A_**
	200	5	10	208		**ECX19H5EAE-_**		**ECX19H8EAE-_**		**XTAE032B10E_**
	230	5	10 (10)	240		**ECX19H5BAE-_**		**ECX19H8BAE-_**		**XTAE032B10B_**
	380	—	15 (15)	380/50 Hz		**ECX19H5LAE-_**		**ECX19H8LAE-_**		**XTAE032B10L_**
	460	—	20	480		**ECX19H5CAE-_**		**ECX19H8CAE-_**		**XTAE032B10C_**
	575	—	25	600		**ECX19H5DAE-_**		**ECX19H8DAE-_**		**XTAE032B10D_**
Frame J										
40	—	—	—	—	60A	**ECX19J5AAA-_**		**ECX19J8AAA-_**		**XTAE040B00A_**
	115	3	—	120		**ECX19J5AAE-_**		**ECX19J8AAE-_**		**XTAE040B00A_**
	200	5	10	208		**ECX19J5EAE-_**		**ECX19J8EAE-_**		**XTAE040B00E_**
	230	7-1/2	15 (12.5)	240		**ECX19J5BAE-_**		**ECX19J8BAE-_**		**XTAE040B00B_**
	380	—	15 (17.5)	380/50 Hz		**ECX19J5LAE-_**		**ECX19J8LAE-_**		**XTAE040B00L_**
	460	—	30	480		**ECX19J5CAE-_**		**ECX19J8CAE-_**		**XTAE040B00C_**
	575	—	40	600		**ECX19J5DAE-_**		**ECX19J8DAE-_**		**XTAE040B00D_**
Frame K										
50	—	—	—	—	60A	**ECX19K5AAA-_**		**ECX19K8AAA-_**		**XTAE050B00A_**
	115	3	—	120		**ECX19K5AAE-_**		**ECX19K8AAE-_**		**XTAE050B00A_**
	200	7-1/2	15	208		**ECX19K5EAE-_**		**ECX19K8EAE-_**		**XTAE050B00E_**
	230	10	20 (15.5)	240		**ECX19K5BAE-_**		**ECX19K8BAE-_**		**XTAE050B00B_**
	380	—	20 (22)	380/50 Hz		**ECX19K5LAE-_**		**ECX19K8LAE-_**		**XTAE050B00L_**
	460	—	40	480		**ECX19K5CAE-_**		**ECX19K8CAE-_**		**XTAE050B00C_**
	575	—	50	600		**ECX19K5DAE-_**		**ECX19K8DAE-_**		**XTAE050B00D_**
Frame L										
65	—	—	—	—	100A	**ECX19L5AAA-_**		**ECX19L8AAA-_**		**XTAE065B00A_**
	115	5	—	120		**ECX19L5AAG-_**		**ECX19L8AAG-_**		**XTAE065B00A_**
	200	10	20	208		**ECX19L5EAG-_**		**ECX19L8EAG-_**		**XTAE065B00E_**
	230	15	25 (20)	240		**ECX19L5BAG-_**		**ECX19L8BAG-_**		**XTAE065B00B_**
	380	—	30 (30)	380/50 Hz		**ECX19L5LAG-_**		**ECX19L8LAG-_**		**XTAE065B00L_**
	460	—	50	480		**ECX19L5CAG-_**		**ECX19L8CAG-_**		**XTAE065B00C_**
	575	—	60	600		**ECX19L5DAG-_**		**ECX19L8DAG-_**		**XTAE065B00D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ See Catalog Number Selection on **Page 90** to identify KEMA rated (gG) fuse blocks.
⑤ Contact factory for other voltage options.

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Table 132. Class 20 — XT FVR Combination with Fused Disconnect (Type 1 and Type 4X) ④

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 1/IP23		Type 4X/IP66 ⑤		Component
	Motor Voltage ⑥	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame B										
7	—	—	—	—	30A	**ECX20B1AAA-_**		**ECX20B4AAA-_**		**XTAR007B21A_**
	115	1/4	—	120		**ECX20B1AAC-_**		**ECX20B4AAC-_**		**XTAR007B21A_**
	200	3/4	1-1/2	208		**ECX20B1EAC-_**		**ECX20B4EAC-_**		**XTAR007B21E_**
	230	1	2 (2.2)	240		**ECX20B1BAC-_**		**ECX20B4BAC-_**		**XTAR007B21B_**
	380	—	3 (3)	380/50 Hz		**ECX20B1LAC-_**		**ECX20B4LAC-_**		**XTAR007B21L_**
	460	—	3	480		**ECX20B1CAC-_**		**ECX20B4CAC-_**		**XTAR007B21C_**
	575	—	5	600		**ECX20B1DAC-_**		**ECX20B4DAC-_**		**XTAR007B21D_**
Frame C										
9	—	—	—	—	30A	**ECX20C1AAA-_**		**ECX20C4AAA-_**		**XTAR009B21A_**
	115	1/2	—	120		**ECX20C1AAC-_**		**ECX20C4AAC-_**		**XTAR009B21A_**
	200	1	3	208		**ECX20C1EAC-_**		**ECX20C4EAC-_**		**XTAR009B21E_**
	230	1-1/2	3 (2.5)	240		**ECX20C1CAC-_**		**ECX20C4CAC-_**		**XTAR009B21B_**
	380	—	4 (4)	380/50 Hz		**ECX20C1LAC-_**		**ECX20C4LAC-_**		**XTAR009B21L_**
	460	—	5	480		**ECX20C1CAC-_**		**ECX20C4CAC-_**		**XTAR009B21C_**
	575	—	7-1/2	600		**ECX20C1DAC-_**		**ECX20C4DAC-_**		**XTAR009B21D_**
Frame D										
12	—	—	—	—	30A	**ECX20D1AAA-_**		**ECX20D4AAA-_**		**XTAR012B21A_**
	115	1	—	120		**ECX20D1AAC-_**		**ECX20D4AAC-_**		**XTAR012B21A_**
	200	2	3	208		**ECX20D1EAC-_**		**ECX20D4EAC-_**		**XTAR012B21E_**
	230	2	3 (3.5)	240		**ECX20D1BAC-_**		**ECX20D4BAC-_**		**XTAR012B21B_**
	380	—	5 (5.5)	380/50 Hz		**ECX20D1LAC-_**		**ECX20D4LAC-_**		**XTAR012B21L_**
	460	—	10	480		**ECX20D1CAC-_**		**ECX20D4CAC-_**		**XTAR012B21C_**
	575	—	10	600		**ECX20D1DAC-_**		**ECX20D4DAC-_**		**XTAR012B21D_**
Frame E										
15	—	—	—	—	30A	**ECX20E1AAA-_**		**ECX20E4AAA-_**		**XTAR015B21A_**
	115	1	—	120		**ECX20E1AAC-_**		**ECX20E4AAC-_**		**XTAR015B21A_**
	200	2	5	208		**ECX20E1EAC-_**		**ECX20E4EAC-_**		**XTAR015B21E_**
	230	3	5 (5)	240		**ECX20E1BAC-_**		**ECX20E4BAC-_**		**XTAR015B21B_**
	380	—	5 (7.5)	380/50 Hz		**ECX20E1LAC-_**		**ECX20E4LAC-_**		**XTAR015B21L_**
	460	—	10	480		**ECX20E1CAC-_**		**ECX20E4CAC-_**		**XTAR015B21C_**
	575	—	10	600		**ECX20E1DAC-_**		**ECX20E4DAC-_**		**XTAR015B21D_**
Frame F										
18	—	—	—	—	30A	**ECX20F1AAA-_**		**ECX20F4AAA-_**		**XTAR018B21A_**
	115	2	—	120		**ECX20F1AAC-_**		**ECX20F4AAC-_**		**XTAR018B21A_**
	200	2	5	208		**ECX20F1EAC-_**		**ECX20F4EAC-_**		**XTAR018B21E_**
	230	3	5 (5)	240		**ECX20F1BAC-_**		**ECX20F4BAC-_**		**XTAR018B21B_**
	380	—	7-1/2 (5)	380/50 Hz		**ECX20F1LAC-_**		**ECX20F4LAC-_**		**XTAR018B21L_**
	460	—	10	480		**ECX20F1CAC-_**		**ECX20F4CAC-_**		**XTAR018B21C_**
	575	—	15	600		**ECX20F1DAC-_**		**ECX20F4DAC-_**		**XTAR018B21D_**
Frame G										
25	—	—	—	—	30A	**ECX20G1AAA-_**		**ECX20G4AAA-_**		**XTAR025B21A_**
	115	2	—	120		**ECX20G1AAC-_**		**ECX20G4AAC-_**		**XTAR025B21A_**
	200	3	7-1/2	208		**ECX20G1EAC-_**		**ECX20G4EAC-_**		**XTAR025B21E_**
	230	5	7-1/2 (7.5)	240		**ECX20G1BAC-_**		**ECX20G4BAC-_**		**XTAR025B21B_**
	380	—	10 (10)	380/50 Hz		**ECX20G1LAC-_**		**ECX20G4LAC-_**		**XTAR025B21L_**
	460	—	15	480		**ECX20G1CAC-_**		**ECX20G4CAC-_**		**XTAR025B21C_**
	575	—	20	600		**ECX20G1DAC-_**		**ECX20G4DAC-_**		**XTAR025B21D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ See Catalog Number Selection on **Page 90** to identify KEMA rated (gG) fuse blocks.
⑤ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX20B**4**AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.
⑥ Contact factory for other voltage options.

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Table 132. Class 20 — XT FVR Combination with Fused Disconnect (Type 1 and Type 4X) (Continued) ④

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 1/IP23		Type 4X/IP66 ⑤		Component
	Motor Voltage ⑥	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame H										
32	—	—	—	—	60A	**ECX20H1AAA-_**		**ECX20H4AAA-_**		**XTAR032B21A_**
	115	3	—	120		**ECX20H1AAE-_**		**ECX20H4AAE-_**		**XTAR032B21A_**
	200	5	10	208		**ECX20H1EAE-_**		**ECX20H4EAE-_**		**XTAR032B21E_**
	230	5	10 (10)	240		**ECX20H1BAE-_**		**ECX20H4BAE-_**		**XTAR032B21B_**
	380	—	15 (15)	380/50 Hz		**ECX20H1LAE-_**		**ECX20H4LAE-_**		**XTAR032B21L_**
	460	—	20	480		**ECX20H1CAE-_**		**ECX20H4CAE-_**		**XTAR032B21C_**
	575	—	25	600		**ECX20H1DAE-_**		**ECX20H4DAE-_**		**XTAR032B21D_**
Frame J										
40	—	—	—	—	60A	**ECX20J1AAA-_**		**ECX20J4AAA-_**		**XTAR040B11A_**
	115	3	—	120		**ECX20J1AAE-_**		**ECX20J4AAE-_**		**XTAR040B11A_**
	200	5	10	208		**ECX20J1EAE-_**		**ECX20J4EAE-_**		**XTAR040B11E_**
	230	7-1/2	15 (12.5)	240		**ECX20J1BAE-_**		**ECX20J4BAE-_**		**XTAR040B11B_**
	380	—	15 (17.5)	380/50 Hz		**ECX20J1LAE-_**		**ECX20J4LAE-_**		**XTAR040B11L_**
	460	—	30	480		**ECX20J1CAE-_**		**ECX20J4CAE-_**		**XTAR040B11C_**
	575	—	40	600		**ECX20J1DAE-_**		**ECX20J4DAE-_**		**XTAR040B11D_**
Frame K										
50	—	—	—	—	60A	**ECX20K1AAA-_**		**ECX20K4AAA-_**		**XTAR050B11A_**
	115	3	—	120		**ECX20K1AAE-_**		**ECX20K4AAE-_**		**XTAR050B11A_**
	200	7-1/2	15	208		**ECX20K1EAE-_**		**ECX20K4EAE-_**		**XTAR050B11E_**
	230	10	20 (15.5)	240		**ECX20K1BAE-_**		**ECX20K4BAE-_**		**XTAR050B11B_**
	380	—	20 (22)	380/50 Hz		**ECX20K1LAE-_**		**ECX20K4LAE-_**		**XTAR050B11L_**
	460	—	40	480		**ECX20K1CAE-_**		**ECX20K4CAE-_**		**XTAR050B11C_**
	575	—	50	600		**ECX20K1DAE-_**		**ECX20K4DAE-_**		**XTAR050B11D_**
Frame L										
65	—	—	—	—	100A	**ECX20L1AAA-_**		**ECX20L4AAA-_**		**XTAR065B11A_**
	115	5	—	120		**ECX20L1AAG-_**		**ECX20L4AAG-_**		**XTAR065B11A_**
	200	10	20	208		**ECX20L1EAG-_**		**ECX20L4EAG-_**		**XTAR065B11E_**
	230	15	25 (20)	240		**ECX20L1BAG-_**		**ECX20L4BAG-_**		**XTAR065B11B_**
	380	—	30 (30)	380/50 Hz		**ECX20L1LAG-_**		**ECX20L4LAG-_**		**XTAR065B11L_**
	460	—	50	480		**ECX20L1CAG-_**		**ECX20L4CAG-_**		**XTAR065B11C_**
	575	—	60	600		**ECX20L1DAG-_**		**ECX20L4DAG-_**		**XTAR065B11D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ See Catalog Number Selection on **Page 90** to identify KEMA rated (gG) fuse blocks.
⑤ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX20B**4**AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.
⑥ Contact factory for other voltage options.

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Table 133. Class 20 — XT FVR Combination with Fused Disconnect (Type 4X Nonmetallic and Type 12) ④

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame B										
7	—	—	—	—	30A	**ECX20B5AAA-_**		**ECX20B8AAA-_**		**XTAR007B21A_**
	115	1/4	—	120		**ECX20B5AAC-_**		**ECX20B8AAC-_**		**XTAR007B21A_**
	200	3/4	1-1/2	208		**ECX20B5EAC-_**		**ECX20B8EAC-_**		**XTAR007B21E_**
	230	1	2 (2.2)	240		**ECX20B5BAC-_**		**ECX20B8BAC-_**		**XTAR007B21B_**
	380	—	3 (3)	380/50 Hz		**ECX20B5LAC-_**		**ECX20B8LAC-_**		**XTAR007B21L_**
	460	—	3	480		**ECX20B5CAC-_**		**ECX20B8CAC-_**		**XTAR007B21C_**
	575	—	5	600		**ECX20B5DAC-_**		**ECX20B8DAC-_**		**XTAR007B21D_**
Frame C										
9	—	—	—	—	30A	**ECX20C5AAA-_**		**ECX20C8AAA-_**		**XTAR009B21A_**
	115	1/2	—	120		**ECX20C5AAC-_**		**ECX20C8AAC-_**		**XTAR009B21A_**
	200	1	3	208		**ECX20C5EAC-_**		**ECX20C8EAC-_**		**XTAR009B21E_**
	230	1-1/2	3 (2.5)	240		**ECX20C5CAC-_**		**ECX20C8CAC-_**		**XTAR009B21B_**
	380	—	4 (4)	380/50 Hz		**ECX20C5LAC-_**		**ECX20C8LAC-_**		**XTAR009B21L_**
	460	—	5	480		**ECX20C5CAC-_**		**ECX20C8CAC-_**		**XTAR009B21C_**
	575	—	7-1/2	600		**ECX20C5DAC-_**		**ECX20C8DAC-_**		**XTAR009B21D_**
Frame D										
12	—	—	—	—	30A	**ECX20D5AAA-_**		**ECX20D8AAA-_**		**XTAR012B21A_**
	115	1	—	120		**ECX20D5AAC-_**		**ECX20D8AAC-_**		**XTAR012B21A_**
	200	2	3	208		**ECX20D5EAC-_**		**ECX20D8EAC-_**		**XTAR012B21E_**
	230	2	3 (3.5)	240		**ECX20D5BAC-_**		**ECX20D8BAC-_**		**XTAR012B21B_**
	380	—	5 (5.5)	380/50 Hz		**ECX20D5LAC-_**		**ECX20D8LAC-_**		**XTAR012B21L_**
	460	—	10	480		**ECX20D5CAC-_**		**ECX20D8CAC-_**		**XTAR012B21C_**
	575	—	10	600		**ECX20D5DAC-_**		**ECX20D8DAC-_**		**XTAR012B21D_**
Frame E										
15	—	—	—	—	30A	**ECX20E5AAA-_**		**ECX20E8AAA-_**		**XTAR015B21A_**
	115	1	—	120		**ECX20E5AAC-_**		**ECX20E8AAC-_**		**XTAR015B21A_**
	200	2	5	208		**ECX20E5EAC-_**		**ECX20E8EAC-_**		**XTAR015B21E_**
	230	3	5 (5)	240		**ECX20E5BAC-_**		**ECX20E8BAC-_**		**XTAR015B21B_**
	380	—	5 (7.5)	380/50 Hz		**ECX20E5LAC-_**		**ECX20E8LAC-_**		**XTAR015B21L_**
	460	—	10	480		**ECX20E5CAC-_**		**ECX20E8CAC-_**		**XTAR015B21C_**
	575	—	10	600		**ECX20E5DAC-_**		**ECX20E8DAC-_**		**XTAR015B21D_**
Frame F										
18	—	—	—	—	30A	**ECX20F5AAA-_**		**ECX20F8AAA-_**		**XTAR018B21A_**
	115	2	—	120		**ECX20F5AAC-_**		**ECX20F8AAC-_**		**XTAR018B21A_**
	200	2	5	208		**ECX20F5EAC-_**		**ECX20F8EAC-_**		**XTAR018B21E_**
	230	3	5 (5)	240		**ECX20F5BAC-_**		**ECX20F8BAC-_**		**XTAR018B21B_**
	380	—	7-1/2 (5)	380/50 Hz		**ECX20F5LAC-_**		**ECX20F8LAC-_**		**XTAR018B21L_**
	460	—	10	480		**ECX20F5CAC-_**		**ECX20F8CAC-_**		**XTAR018B21C_**
	575	—	15	600		**ECX20F5DAC-_**		**ECX20F8DAC-_**		**XTAR018B21D_**
Frame G										
25	—	—	—	—	30A	**ECX20G5AAA-_**		**ECX20G8AAA-_**		**XTAR025B21A_**
	115	2	—	120		**ECX20G5AAC-_**		**ECX20G8AAC-_**		**XTAR025B21A_**
	200	3	7-1/2	208		**ECX20G5EAC-_**		**ECX20G8EAC-_**		**XTAR025B21E_**
	230	5	7-1/2 (7.5)	240		**ECX20G5BAC-_**		**ECX20G8BAC-_**		**XTAR025B21B_**
	380	—	10 (10)	380/50 Hz		**ECX20G5LAC-_**		**ECX20G8LAC-_**		**XTAR025B21L_**
	460	—	15	480		**ECX20G5CAC-_**		**ECX20G8CAC-_**		**XTAR025B21C_**
	575	—	20	600		**ECX20G5DAC-_**		**ECX20G8DAC-_**		**XTAR025B21D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ See Catalog Number Selection on **Page 90** to identify KEMA rated (gG) fuse blocks.
⑤ Contact factory for other voltage options.

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Table 133. Class 20 — XT FVR Combination with Fused Disconnect (Type 4X Nonmetallic and Type 12) (Continued) ④

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	Fuse Clips	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame H										
32	—	—	—	—	60A	**ECX20H5AAA-_**		**ECX20H8AAA-_**		**XTAR032B21A_**
	115	3	—	120		**ECX20H5AAE-_**		**ECX20H8AAE-_**		**XTAR032B21A_**
	200	5	10	208		**ECX20H5EAE-_**		**ECX20H8EAE-_**		**XTAR032B21E_**
	230	5	10 (10)	240		**ECX20H5BAE-_**		**ECX20H8BAE-_**		**XTAR032B21B_**
	380	—	15 (15)	380/50 Hz		**ECX20H5LAE-_**		**ECX20H8LAE-_**		**XTAR032B21L_**
	460	—	20	480		**ECX20H5CAE-_**		**ECX20H8CAE-_**		**XTAR032B21C_**
	575	—	25	600		**ECX20H5DAE-_**		**ECX20H8DAE-_**		**XTAR032B21D_**
Frame J										
40	—	—	—	—	60A	**ECX20J5AAA-_**		**ECX20J8AAA-_**		**XTAR040B11A_**
	115	3	—	120		**ECX20J5AAE-_**		**ECX20J8AAE-_**		**XTAR040B11A_**
	200	5	10	208		**ECX20J5EAE-_**		**ECX20J8EAE-_**		**XTAR040B11E_**
	230	7-1/2	15 (12.5)	240		**ECX20J5BAE-_**		**ECX20J8BAE-_**		**XTAR040B11B_**
	380	—	15 (17.5)	380/50 Hz		**ECX20J5LAE-_**		**ECX20J8LAE-_**		**XTAR040B11L_**
	460	—	30	480		**ECX20J5CAE-_**		**ECX20J8CAE-_**		**XTAR040B11C_**
	575	—	40	600		**ECX20J5DAE-_**		**ECX20J8DAE-_**		**XTAR040B11D_**
Frame K										
50	—	—	—	—	60A	**ECX20K5AAA-_**		**ECX20K8AAA-_**		**XTAR050B11A_**
	115	3	—	120		**ECX20K5AAE-_**		**ECX20K8AAE-_**		**XTAR050B11A_**
	200	7-1/2	15	208		**ECX20K5EAE-_**		**ECX20K8EAE-_**		**XTAR050B11E_**
	230	10	20 (15.5)	240		**ECX20K5BAE-_**		**ECX20K8BAE-_**		**XTAR050B11B_**
	380	—	20 (22)	380/50 Hz		**ECX20K5LAE-_**		**ECX20K8LAE-_**		**XTAR050B11L_**
	460	—	40	480		**ECX20K5CAE-_**		**ECX20K8CAE-_**		**XTAR050B11C_**
	575	—	50	600		**ECX20K5DAE-_**		**ECX20K8DAE-_**		**XTAR050B11D_**
Frame L										
65	—	—	—	—	100A	**ECX20L5AAA-_**		**ECX20L8AAA-_**		**XTAR065B11A_**
	115	5	—	120		**ECX20L5AAG-_**		**ECX20L8AAG-_**		**XTAR065B11A_**
	200	10	20	208		**ECX20L5EAG-_**		**ECX20L8EAG-_**		**XTAR065B11E_**
	230	15	25 (20)	240		**ECX20L5BAG-_**		**ECX20L8BAG-_**		**XTAR065B11B_**
	380	—	30 (30)	380/50 Hz		**ECX20L5LAG-_**		**ECX20L8LAG-_**		**XTAR065B11L_**
	460	—	50	480		**ECX20L5CAG-_**		**ECX20L8CAG-_**		**XTAR065B11C_**
	575	—	60	600		**ECX20L5DAG-_**		**ECX20L8DAG-_**		**XTAR065B11D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ See Catalog Number Selection on **Page 90** to identify KEMA rated (gG) fuse blocks.
⑤ Contact factory for other voltage options.

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Table 134. Class 25 — XT FVNR with HMCP/E (Type 1 and Type 4X)

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	HMCPE	Type 1/IP23		Type 4X/IP66 ④		Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame B										
7	—	—	—	—	15A	**ECX25B1AAA-_**		**ECX25B4AAA-_**		**XTAE007B10A_**
	115	1/4	—	120		**ECX25B1AAD-_**		**ECX25B4AAD-_**		**XTAE007B10A_**
	200	3/4	1-1/2	208		**ECX25B1EAD-_**		**ECX25B4EAD-_**		**XTAE007B10E_**
	230	1	2 (2.2)	240		**ECX25B1BAD-_**		**ECX25B4BAD-_**		**XTAE007B10B_**
	380	—	3 (3)	380/50 Hz		**ECX25B1LAD-_**		**ECX25B4LAD-_**		**XTAE007B10L_**
	460	—	3	480		**ECX25B1CAD-_**		**ECX25B4CAD-_**		**XTAE007B10C_**
	575	—	5	600		**ECX25B1DAD-_**		**ECX25B4DAD-_**		**XTAE007B10D_**
Frame C										
9	—	—	—	—	15A	**ECX25C1AAA-_**		**ECX25C4AAA-_**		**XTAE009B10A_**
	115	1/2	—	120		**ECX25C1AAD-_**		**ECX25C4AAD-_**		**XTAE009B10A_**
	200	1	3	208		**ECX25C1EAD-_**		**ECX25C4EAD-_**		**XTAE009B10E_**
	230	1-1/2	3 (2.5)	240		**ECX25C1CAD-_**		**ECX25C4CAD-_**		**XTAE009B10B_**
	380	—	4 (4)	380/50 Hz		**ECX25C1LAD-_**		**ECX25C4LAD-_**		**XTAE009B10L_**
	460	—	5	480		**ECX25C1CAD-_**		**ECX25C4CAD-_**		**XTAE009B10C_**
	575	—	7-1/2	600		**ECX25C1DAD-_**		**ECX25C4DAD-_**		**XTAE009B10D_**
Frame D										
12	—	—	—	—	15A	**ECX25D1AAA-_**		**ECX25D4AAA-_**		**XTAE012B10A_**
	115	1	—	120		**ECX25D1AAD-_**		**ECX25D4AAD-_**		**XTAE012B10A_**
	200	2	3	208		**ECX25D1EAD-_**		**ECX25D4EAD-_**		**XTAE012B10E_**
	230	2	3 (3.5)	240		**ECX25D1BAD-_**		**ECX25D4BAD-_**		**XTAE012B10B_**
	380	—	5 (5.5)	380/50 Hz		**ECX25D1LAD-_**		**ECX25D4LAD-_**		**XTAE012B10L_**
	460	—	10	480		**ECX25D1CAE-_**		**ECX25D4CAE-_**		**XTAE012B10C_**
	575	—	10	600		**ECX25D1DAD-_**		**ECX25D4DAD-_**		**XTAE012B10D_**
Frame E										
15	—	—	—	—	30A	**ECX25E1AAA-_**		**ECX25E4AAA-_**		**XTAE015B10A_**
	115	1	—	120		**ECX25E1AAE-_**		**ECX25E4AAE-_**		**XTAE015B10A_**
	200	2	5	208		**ECX25E1EAE-_**		**ECX25E4EAE-_**		**XTAE015B10E_**
	230	3	5 (5)	240		**ECX25E1BAE-_**		**ECX25E4BAE-_**		**XTAE015B10B_**
	380	—	5 (7.5)	380/50 Hz		**ECX25E1LAE-_**		**ECX25E4LAE-_**		**XTAE015B10L_**
	460	—	10	480		**ECX25E1CAE-_**		**ECX25E4CAE-_**		**XTAE015B10C_**
	575	—	10	600		**ECX25E1DAE-_**		**ECX25E4DAE-_**		**XTAE015B10D_**
Frame F										
18	—	—	—	—	30A	**ECX25F1AAA-_**		**ECX25F4AAA-_**		**XTAE018B10A_**
	115	2	—	120		**ECX25F1AAE-_**		**ECX25F4AAE-_**		**XTAE018B10A_**
	200	2	5	208		**ECX25F1EAE-_**		**ECX25F4EAE-_**		**XTAE018B10E_**
	230	3	5 (5)	240		**ECX25F1BAE-_**		**ECX25F4BAE-_**		**XTAE018B10B_**
	380	—	7-1/2 (5)	380/50 Hz		**ECX25F1LAE-_**		**ECX25F4LAE-_**		**XTAE018B10L_**
	460	—	10	480		**ECX25F1CAE-_**		**ECX25F4CAE-_**		**XTAE018B10C_**
	575	—	15	600		**ECX25F1DAE-_**		**ECX25F4DAE-_**		**XTAE018B10D_**
Frame G										
25	—	—	—	—	50A	**ECX25G1AAA-_**		**ECX25G4AAA-_**		**XTAE025B10A_**
	115	2	—	120		**ECX25G1AAE-_**		**ECX25G4AAE-_**		**XTAE025B10A_**
	200	3	7-1/2	208		**ECX25G1EAE-_**		**ECX25G4EAE-_**		**XTAE025B10E_**
	230	5	7-1/2 (7.5)	240		**ECX25G1BAF-_**		**ECX25G4BAF-_**		**XTAE025B10B_**
	380	—	10 (10)	380/50 Hz		**ECX25G1LAF-_**		**ECX25G4LAF-_**		**XTAE025B10L_**
	460	—	15	480		**ECX25G1CAF-_**		**ECX25G4CAF-_**		**XTAE025B10C_**
	575	—	20	600		**ECX25G1DAF-_**		**ECX25G4DAF-_**		**XTAE025B10D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX25B**4**AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.
⑤ Contact factory for other voltage options.

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Table 134. Class 25 — XT FVNR with HMCP/E (Type 1 and Type 4X) (Continued)

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	HMCPE	Type 1/IP23		Type 4X/IP66 ④		Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame H										
32	—	—	—	—	50A	**ECX25H1AAA-_**		**ECX25H4AAA-_**		**XTAE032B10A_**
	115	3	—	120		**ECX25H1AAF-_**		**ECX25H4AAF-_**		**XTAE032B10A_**
	200	5	10	208		**ECX25H1EAF-_**		**ECX25H4EAF-_**		**XTAE032B10E_**
	230	5	10 (10)	240		**ECX25H1BAF-_**		**ECX25H4BAF-_**		**XTAE032B10B_**
	380	—	15 (15)	380/50 Hz		**ECX25H1LAF-_**		**ECX25H4LAF-_**		**XTAE032B10L_**
	460	—	20	480		**ECX25H1CAF-_**		**ECX25H4CAF-_**		**XTAE032B10C_**
	575	—	25	600		**ECX25H1DAF-_**		**ECX25H4DAF-_**		**XTAE032B10D_**
Frame J										
40	—	—	—	—	50A	**ECX25J1AAA-_**		**ECX25J4AAA-_**		**XTAE040B00A_**
	115	3	—	120		**ECX25J1AAF-_**		**ECX25J4AAF-_**		**XTAE040B00A_**
	200	5	10	208		**ECX25J1EAF-_**		**ECX25J4EAF-_**		**XTAE040B00E_**
	230	7-1/2	15 (12.5)	240		**ECX25J1BAF-_**		**ECX25J4BAF-_**		**XTAE040B00B_**
	380	—	15 (17.5)	380/50 Hz		**ECX25J1LAF-_**		**ECX25J4LAF-_**		**XTAE040B00L_**
	460	—	30	480		**ECX25J1CAF-_**		**ECX25J4CAF-_**		**XTAE040B00C_**
	575	—	40	600		**ECX25J1DAF-_**		**ECX25J4DAF-_**		**XTAE040B00D_**
Frame K										
50	—	—	—	—	63A	**ECX25K1AAA-_**		**ECX25K4AAA-_**		**XTAE050B00A_**
	115	3	—	120		**ECX25K1AAG-_**		**ECX25K4AAG-_**		**XTAE050B00A_**
	200	7-1/2	15	208		**ECX25K1EAG-_**		**ECX25K4EAG-_**		**XTAE050B00E_**
	230	10	20 (15.5)	240		**ECX25K1BAW-_**		**ECX25K4BAW-_**		**XTAE050B00B_**
	380	—	20 (22)	380/50 Hz		**ECX25K1LAW-_**		**ECX25K4LAW-_**		**XTAE050B00L_**
	460	—	40	480		**ECX25K1CAW-_**		**ECX25K4CAW-_**		**XTAE050B00C_**
	575	—	50	600		**ECX25K1DAG-_**		**ECX25K4DAG-_**		**XTAE050B00D_**
Frame L										
65	—	—	—	—	100A	**ECX25L1AAA-_**		**ECX25L4AAA-_**		**XTAE065B00A_**
	115	5	—	120		**ECX25L1AAG-_**		**ECX25L4AAG-_**		**XTAE065B00A_**
	200	10	20	208		**ECX25L1EAG-_**		**ECX25L4EAG-_**		**XTAE065B00E_**
	230	15	25 (20)	240		**ECX25L1BAG-_**		**ECX25L4BAG-_**		**XTAE065B00B_**
	380	—	30 (30)	380/50 Hz		**ECX25L1LAG-_**		**ECX25L4LAG-_**		**XTAE065B00L_**
	460	—	50	480		**ECX25L1CAG-_**		**ECX25L4CAG-_**		**XTAE065B00C_**
	575	—	60	600		**ECX25L1DAG-_**		**ECX25L4DAG-_**		**XTAE065B00D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX25B**4**AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.
⑤ Contact factory for other voltage options.

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Table 135. Class 25 — XT FVNR with HMCP/E (Type 4X Nonmetallic and Type 12)

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	HMCPE	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
	Motor Voltage ④	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame B										
7	—	—	—	—	15A	**ECX25B5AAA-_**		**ECX25B8AAA-_**		**XTAE007B10A_**
	115	1/4	—	120		**ECX25B5AAD-_**		**ECX25B8AAD-_**		**XTAE007B10A_**
	200	3/4	1-1/2	208		**ECX25B5EAD-_**		**ECX25B8EAD-_**		**XTAE007B10E_**
	230	1	2 (2.2)	240		**ECX25B5BAD-_**		**ECX25B8BAD-_**		**XTAE007B10B_**
	380	—	3 (3)	380/50 Hz		**ECX25B5LAD-_**		**ECX25B8LAD-_**		**XTAE007B10L_**
	460	—	3	480		**ECX25B5CAD-_**		**ECX25B8CAD-_**		**XTAE007B10C_**
	575	—	5	600		**ECX25B5DAD-_**		**ECX25B8DAD-_**		**XTAE007B10D_**
Frame C										
9	—	—	—	—	15A	**ECX25C5AAA-_**		**ECX25C8AAA-_**		**XTAE009B10A_**
	115	1/2	—	120		**ECX25C5AAD-_**		**ECX25C8AAD-_**		**XTAE009B10A_**
	200	1	3	208		**ECX25C5EAD-_**		**ECX25C8EAD-_**		**XTAE009B10E_**
	230	1-1/2	3 (2.5)	240		**ECX25C5CAD-_**		**ECX25C8CAD-_**		**XTAE009B10B_**
	380	—	4 (4)	380/50 Hz		**ECX25C5LAD-_**		**ECX25C8LAD-_**		**XTAE009B10L_**
	460	—	5	480		**ECX25C5CAD-_**		**ECX25C8CAD-_**		**XTAE009B10C_**
	575	—	7-1/2	600		**ECX25C5DAD-_**		**ECX25C8DAD-_**		**XTAE009B10D_**
Frame D										
12	—	—	—	—	15A	**ECX25D5AAA-_**		**ECX25D8AAA-_**		**XTAE012B10A_**
	115	1	—	120		**ECX25D5AAD-_**		**ECX25D8AAD-_**		**XTAE012B10A_**
	200	2	3	208		**ECX25D5EAD-_**		**ECX25D8EAD-_**		**XTAE012B10E_**
	230	2	3 (3.5)	240		**ECX25D5BAD-_**		**ECX25D8BAD-_**		**XTAE012B10B_**
	380	—	5 (5.5)	380/50 Hz		**ECX25D5LAD-_**		**ECX25D8LAD-_**		**XTAE012B10L_**
	460	—	10	480		**ECX25D5CAE-_**		**ECX25D8CAE-_**		**XTAE012B10C_**
	575	—	10	600		**ECX25D5DAD-_**		**ECX25D8DAD-_**		**XTAE012B10D_**
Frame E										
15	—	—	—	—	30A	**ECX25E5AAA-_**		**ECX25E8AAA-_**		**XTAE015B10A_**
	115	1	—	120		**ECX25E5AAE-_**		**ECX25E8AAE-_**		**XTAE015B10A_**
	200	2	5	208		**ECX25E5EAE-_**		**ECX25E8EAE-_**		**XTAE015B10E_**
	230	3	5 (5)	240		**ECX25E5BAE-_**		**ECX25E8BAE-_**		**XTAE015B10B_**
	380	—	5 (7.5)	380/50 Hz		**ECX25E5LAE-_**		**ECX25E8LAE-_**		**XTAE015B10L_**
	460	—	10	480		**ECX25E5CAE-_**		**ECX25E8CAE-_**		**XTAE015B10C_**
	575	—	10	600		**ECX25E5DAE-_**		**ECX25E8DAE-_**		**XTAE015B10D_**
Frame F										
18	—	—	—	—	30A	**ECX25F5AAA-_**		**ECX25F8AAA-_**		**XTAE018B10A_**
	115	2	—	120		**ECX25F5AAE-_**		**ECX25F8AAE-_**		**XTAE018B10A_**
	200	2	5	208		**ECX25F5EAE-_**		**ECX25F8EAE-_**		**XTAE018B10E_**
	230	3	5 (5)	240		**ECX25F5BAE-_**		**ECX25F8BAE-_**		**XTAE018B10B_**
	380	—	7-1/2 (5)	380/50 Hz		**ECX25F5LAE-_**		**ECX25F8LAE-_**		**XTAE018B10L_**
	460	—	10	480		**ECX25F5CAE-_**		**ECX25F8CAE-_**		**XTAE018B10C_**
	575	—	15	600		**ECX25F5DAE-_**		**ECX25F8DAE-_**		**XTAE018B10D_**
Frame G										
25	—	—	—	—	50A	**ECX25G5AAA-_**		**ECX25G8AAA-_**		**XTAE025B10A_**
	115	2	—	120		**ECX25G5AAE-_**		**ECX25G8AAE-_**		**XTAE025B10A_**
	200	3	7-1/2	208		**ECX25G5EAE-_**		**ECX25G8EAE-_**		**XTAE025B10E_**
	230	5	7-1/2 (7.5)	240		**ECX25G5BAF-_**		**ECX25G8BAF-_**		**XTAE025B10B_**
	380	—	10 (10)	380/50 Hz		**ECX25G5LAF-_**		**ECX25G8LAF-_**		**XTAE025B10L_**
	460	—	15	480		**ECX25G5CAF-_**		**ECX25G8CAF-_**		**XTAE025B10C_**
	575	—	20	600		**ECX25G5DAF-_**		**ECX25G8DAF-_**		**XTAE025B10D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ Contact factory for other voltage options.

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Table 135. Class 25 — XT FVNR with HMCP/E (Type 4X Nonmetallic and Type 12) (Continued)

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	HMCPE	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
	Motor Voltage ④	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame H										
32	—	—	—	—	50A	**ECX25H5AAA-_**		**ECX25H8AAA-_**		**XTAE032B10A_**
	115	3	—	120		**ECX25H5AAF-_**		**ECX25H8AAF-_**		**XTAE032B10A_**
	200	5	10	208		**ECX25H5EAF-_**		**ECX25H8EAF-_**		**XTAE032B10E_**
	230	5	10 (10)	240		**ECX25H5BAF-_**		**ECX25H8BAF-_**		**XTAE032B10B_**
	380	—	15 (15)	380/50 Hz		**ECX25H5LAF-_**		**ECX25H8LAF-_**		**XTAE032B10L_**
	460	—	20	480		**ECX25H5CAF-_**		**ECX25H8CAF-_**		**XTAE032B10C_**
	575	—	25	600		**ECX25H5DAF-_**		**ECX25H8DAF-_**		**XTAE032B10D_**
Frame J										
40	—	—	—	—	50A	**ECX25J5AAA-_**		**ECX25J8AAA-_**		**XTAE040B00A_**
	115	3	—	120		**ECX25J5AAF-_**		**ECX25J8AAF-_**		**XTAE040B00A_**
	200	5	10	208		**ECX25J5EAF-_**		**ECX25J8EAF-_**		**XTAE040B00E_**
	230	7-1/2	15 (12.5)	240		**ECX25J5BAF-_**		**ECX25J8BAF-_**		**XTAE040B00B_**
	380	—	15 (17.5)	380/50 Hz		**ECX25J5LAF-_**		**ECX25J8LAF-_**		**XTAE040B00L_**
	460	—	30	480		**ECX25J5CAF-_**		**ECX25J8CAF-_**		**XTAE040B00C_**
	575	—	40	600		**ECX25J5DAF-_**		**ECX25J8DAF-_**		**XTAE040B00D_**
Frame K										
50	—	—	—	—	63A	**ECX25K5AAA-_**		**ECX25K8AAA-_**		**XTAE050B00A_**
	115	3	—	120		**ECX25K5AAG-_**		**ECX25K8AAG-_**		**XTAE050B00A_**
	200	7-1/2	15	208		**ECX25K5EAG-_**		**ECX25K8EAG-_**		**XTAE050B00E_**
	230	10	20 (15.5)	240		**ECX25K5BAW-_**		**ECX25K8BAW-_**		**XTAE050B00B_**
	380	—	20 (22)	380/50 Hz		**ECX25K5LAW-_**		**ECX25K8LAW-_**		**XTAE050B00L_**
	460	—	40	480		**ECX25K5CAW-_**		**ECX25K8CAW-_**		**XTAE050B00C_**
	575	—	50	600		**ECX25K5DAG-_**		**ECX25K8DAG-_**		**XTAE050B00D_**
Frame L										
65	—	—	—	—	100A	**ECX25L5AAA-_**		**ECX25L8AAA-_**		**XTAE065B00A_**
	115	5	—	120		**ECX25L5AAG-_**		**ECX25L8AAG-_**		**XTAE065B00A_**
	200	10	20	208		**ECX25L5EAG-_**		**ECX25L8EAG-_**		**XTAE065B00E_**
	230	15	25 (20)	240		**ECX25L5BAG-_**		**ECX25L8BAG-_**		**XTAE065B00B_**
	380	—	30 (30)	380/50 Hz		**ECX25L5LAG-_**		**ECX25L8LAG-_**		**XTAE065B00L_**
	460	—	50	480		**ECX25L5CAG-_**		**ECX25L8CAG-_**		**XTAE065B00C_**
	575	—	60	600		**ECX25L5DAG-_**		**ECX25L8DAG-_**		**XTAE065B00D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ Contact factory for other voltage options.

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Table 136. Class 26 — XT FVR Combination with HMCP/E (Type 1 and Type 4X)

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	HMCPE	Type 1/IP23		Type 4X/IP66 ④		Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame B										
7	—	—	—	—	15A	**ECX26B1AAA-_**		**ECX26B4AAA-_**		**XTAR007B21A_**
	115	1/4	—	120		**ECX26B1AAD-_**		**ECX26B4AAD-_**		**XTAR007B21A_**
	200	3/4	1-1/2	208		**ECX26B1EAD-_**		**ECX26B4EAD-_**		**XTAR007B21E_**
	230	1	2 (2.2)	240		**ECX26B1BAD-_**		**ECX26B4BAD-_**		**XTAR007B21B_**
	380	—	3 (3)	380/50 Hz		**ECX26B1LAD-_**		**ECX26B4LAD-_**		**XTAR007B21L_**
	460	—	3	480		**ECX26B1CAD-_**		**ECX26B4CAD-_**		**XTAR007B21C_**
	575	—	5	600		**ECX26B1DAD-_**		**ECX26B4DAD-_**		**XTAR007B21D_**
Frame C										
9	—	—	—	—	15A	**ECX26C1AAA-_**		**ECX26C4AAA-_**		**XTAR009B21A_**
	115	1/2	—	120		**ECX26C1AAD-_**		**ECX26C4AAD-_**		**XTAR009B21A_**
	200	1	3	208		**ECX26C1EAD-_**		**ECX26C4EAD-_**		**XTAR009B21E_**
	230	1-1/2	3 (2.5)	240		**ECX26C1CAD-_**		**ECX26C4CAD-_**		**XTAR009B21B_**
	380	—	4 (4)	380/50 Hz		**ECX26C1LAD-_**		**ECX26C4LAD-_**		**XTAR009B21L_**
	460	—	5	480		**ECX26C1CAD-_**		**ECX26C4CAD-_**		**XTAR009B21C_**
	575	—	7-1/2	600		**ECX26C1DAD-_**		**ECX26C4DAD-_**		**XTAR009B21D_**
Frame D										
12	—	—	—	—	15A	**ECX26D1AAA-_**		**ECX26D4AAA-_**		**XTAR012B21A_**
	115	1	—	120		**ECX26D1AAD-_**		**ECX26D4AAD-_**		**XTAR012B21A_**
	200	2	3	208		**ECX26D1EAD-_**		**ECX26D4EAD-_**		**XTAR012B21E_**
	230	2	3 (3.5)	240		**ECX26D1BAD-_**		**ECX26D4BAD-_**		**XTAR012B21B_**
	380	—	5 (5.5)	380/50 Hz		**ECX26D1LAD-_**		**ECX26D4LAD-_**		**XTAR012B21L_**
	460	—	10	480		**ECX26D1CAE-_**		**ECX26D4CAE-_**		**XTAR012B21C_**
	575	—	10	600		**ECX26D1DAD-_**		**ECX26D4DAD-_**		**XTAR012B21D_**
Frame E										
15	—	—	—	—	30A	**ECX26E1AAA-_**		**ECX26E4AAA-_**		**XTAR015B21A_**
	115	1	—	120		**ECX26E1AAE-_**		**ECX26E4AAE-_**		**XTAR015B21A_**
	200	2	5	208		**ECX26E1EAE-_**		**ECX26E4EAE-_**		**XTAR015B21E_**
	230	3	5 (5)	240		**ECX26E1BAE-_**		**ECX26E4BAE-_**		**XTAR015B21B_**
	380	—	5 (7.5)	380/50 Hz		**ECX26E1LAE-_**		**ECX26E4LAE-_**		**XTAR015B21L_**
	460	—	10	480		**ECX26E1CAE-_**		**ECX26E4CAE-_**		**XTAR015B21C_**
	575	—	10	600		**ECX26E1DAE-_**		**ECX26E4DAE-_**		**XTAR015B21D_**
Frame F										
18	—	—	—	—	30A	**ECX26F1AAA-_**		**ECX26F4AAA-_**		**XTAR018B21A_**
	115	2	—	120		**ECX26F1AAE-_**		**ECX26F4AAE-_**		**XTAR018B21A_**
	200	2	5	208		**ECX26F1EAE-_**		**ECX26F4EAE-_**		**XTAR018B21E_**
	230	3	5 (5)	240		**ECX26F1BAE-_**		**ECX26F4BAE-_**		**XTAR018B21B_**
	380	—	7-1/2 (5)	380/50 Hz		**ECX26F1LAE-_**		**ECX26F4LAE-_**		**XTAR018B21L_**
	460	—	10	480		**ECX26F1CAE-_**		**ECX26F4CAE-_**		**XTAR018B21C_**
	575	—	15	600		**ECX26F1DAE-_**		**ECX26F4DAE-_**		**XTAR018B21D_**
Frame G										
25	—	—	—	—	50A	**ECX26G1AAA-_**		**ECX26G4AAA-_**		**XTAR025B21A_**
	115	2	—	120		**ECX26G1AAE-_**		**ECX26G4AAE-_**		**XTAR025B21A_**
	200	3	7-1/2	208		**ECX26G1EAE-_**		**ECX26G4EAE-_**		**XTAR025B21E_**
	230	5	7-1/2 (7.5)	240		**ECX26G1BAF-_**		**ECX26G4BAF-_**		**XTAR025B21B_**
	380	—	10 (10)	380/50 Hz		**ECX26G1LAF-_**		**ECX26G4LAF-_**		**XTAR025B21L_**
	460	—	15	480		**ECX26G1CAF-_**		**ECX26G4CAF-_**		**XTAR025B21C_**
	575	—	20	600		**ECX26G1DAF-_**		**ECX26G4DAF-_**		**XTAR025B21D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX26B**4**AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.
⑤ Contact factory for other voltage options.

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Table 136. Class 26 — XT FVR Combination with HMCP/E (Type 1 and Type 4X) (Continued)

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	HMCPE	Type 1/IP23		Type 4X/IP66 ④		Component
	Motor Voltage ⑤	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame H										
32	—	—	—	—	50A	**ECX26H1AAA-_**		**ECX26H4AAA-_**		**XTAR032B21A_**
	115	3	—	120		**ECX26H1AAF-_**		**ECX26H4AAF-_**		**XTAR032B21A_**
	200	5	10	208		**ECX26H1EAF-_**		**ECX26H4EAF-_**		**XTAR032B21E_**
	230	5	10 (10)	240		**ECX26H1BAF-_**		**ECX26H4BAF-_**		**XTAR032B21B_**
	380	—	15 (15)	380/50 Hz		**ECX26H1LAF-_**		**ECX26H4LAF-_**		**XTAR032B21L_**
	460	—	20	480		**ECX26H1CAF-_**		**ECX26H4CAF-_**		**XTAR032B21C_**
	575	—	25	600		**ECX26H1DAF-_**		**ECX26H4DAF-_**		**XTAR032B21D_**
Frame J										
40	—	—	—	—	50A	**ECX26J1AAA-_**		**ECX26J4AAA-_**		**XTAR040B11A_**
	115	3	—	120		**ECX26J1AAF-_**		**ECX26J4AAF-_**		**XTAR040B11A_**
	200	5	10	208		**ECX26J1EAF-_**		**ECX26J4EAF-_**		**XTAR040B11E_**
	230	7-1/2	15 (12.5)	240		**ECX26J1BAF-_**		**ECX26J4BAF-_**		**XTAR040B11B_**
	380	—	15 (17.5)	380/50 Hz		**ECX26J1LAF-_**		**ECX26J4LAF-_**		**XTAR040B11L_**
	460	—	30	480		**ECX26J1CAF-_**		**ECX26J4CAF-_**		**XTAR040B11C_**
	575	—	40	600		**ECX26J1DAF-_**		**ECX26J4DAF-_**		**XTAR040B11D_**
Frame K										
50	—	—	—	—	63A	**ECX26K1AAA-_**		**ECX26K4AAA-_**		**XTAR050B11A_**
	115	3	—	120		**ECX26K1AAG-_**		**ECX26K4AAG-_**		**XTAR050B11A_**
	200	7-1/2	15	208		**ECX26K1EAG-_**		**ECX26K4EAG-_**		**XTAR050B11E_**
	230	10	20 (15.5)	240		**ECX26K1BAW-_**		**ECX26K4BAW-_**		**XTAR050B11B_**
	380	—	20 (22)	380/50 Hz		**ECX26K1LAW-_**		**ECX26K4LAW-_**		**XTAR050B11L_**
	460	—	40	480		**ECX26K1CAW-_**		**ECX26K4CAW-_**		**XTAR050B11C_**
	575	—	50	600		**ECX26K1DAG-_**		**ECX26K4DAG-_**		**XTAR050B11D_**
Frame L										
65	—	—	—	—	100A	**ECX26L1AAA-_**		**ECX26L4AAA-_**		**XTAR065B11A_**
	115	5	—	120		**ECX26L1AAG-_**		**ECX26L4AAG-_**		**XTAR065B11A_**
	200	10	20	208		**ECX26L1EAG-_**		**ECX26L4EAG-_**		**XTAR065B11E_**
	230	15	25 (20)	240		**ECX26L1BAG-_**		**ECX26L4BAG-_**		**XTAR065B11B_**
	380	—	30 (30)	380/50 Hz		**ECX26L1LAG-_**		**ECX26L4LAG-_**		**XTAR065B11L_**
	460	—	50	480		**ECX26L1CAG-_**		**ECX26L4CAG-_**		**XTAR065B11C_**
	575	—	60	600		**ECX26L1DAG-_**		**ECX26L4DAG-_**		**XTAR065B11D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX26B**4**AAA-_. To order Type 4X 316-Grade Stainless Steel, change that digit to **9**. To order Type 4 Painted Steel, change that digit to **3**.
⑤ Contact factory for other voltage options.

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Table 137. Class 26 — XT FVR Combination with HMCP/E (Type 4X Nonmetallic and Type 12)

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	HMCPE	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
	Motor Voltage ④	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame B										
7	—	—	—	—	15A	**ECX26B5AAA-_**		**ECX26B8AAA-_**		**XTAR007B21A_**
	115	1/4	—	120		**ECX26B5AAD-_**		**ECX26B8AAD-_**		**XTAR007B21A_**
	200	3/4	1-1/2	208		**ECX26B5EAD-_**		**ECX26B8EAD-_**		**XTAR007B21E_**
	230	1	2 (2.2)	240		**ECX26B5BAD-_**		**ECX26B8BAD-_**		**XTAR007B21B_**
	380	—	3 (3)	380/50 Hz		**ECX26B5LAD-_**		**ECX26B8LAD-_**		**XTAR007B21L_**
	460	—	3	480		**ECX26B5CAD-_**		**ECX26B8CAD-_**		**XTAR007B21C_**
	575	—	5	600		**ECX26B5DAD-_**		**ECX26B8DAD-_**		**XTAR007B21D_**
Frame C										
9	—	—	—	—	15A	**ECX26C5AAA-_**		**ECX26C8AAA-_**		**XTAR009B21A_**
	115	1/2	—	120		**ECX26C5AAD-_**		**ECX26C8AAD-_**		**XTAR009B21A_**
	200	1	3	208		**ECX26C5EAD-_**		**ECX26C8EAD-_**		**XTAR009B21E_**
	230	1-1/2	3 (2.5)	240		**ECX26C5CAD-_**		**ECX26C8CAD-_**		**XTAR009B21B_**
	380	—	4 (4)	380/50 Hz		**ECX26C5LAD-_**		**ECX26C8LAD-_**		**XTAR009B21L_**
	460	—	5	480		**ECX26C5CAD-_**		**ECX26C8CAD-_**		**XTAR009B21C_**
	575	—	7-1/2	600		**ECX26C5DAD-_**		**ECX26C8DAD-_**		**XTAR009B21D_**
Frame D										
12	—	—	—	—	15A	**ECX26D5AAA-_**		**ECX26D8AAA-_**		**XTAR012B21A_**
	115	1	—	120		**ECX26D5AAD-_**		**ECX26D8AAD-_**		**XTAR012B21A_**
	200	2	3	208		**ECX26D5EAD-_**		**ECX26D8EAD-_**		**XTAR012B21E_**
	230	2	3 (3.5)	240		**ECX26D5BAD-_**		**ECX26D8BAD-_**		**XTAR012B21B_**
	380	—	5 (5.5)	380/50 Hz		**ECX26D5LAD-_**		**ECX26D8LAD-_**		**XTAR012B21L_**
	460	—	10	480		**ECX26D5CAE-_**		**ECX26D8CAE-_**		**XTAR012B21C_**
	575	—	10	600		**ECX26D5DAD-_**		**ECX26D8DAD-_**		**XTAR012B21D_**
Frame E										
15	—	—	—	—	30A	**ECX26E5AAA-_**		**ECX26E8AAA-_**		**XTAR015B21A_**
	115	1	—	120		**ECX26E5AAE-_**		**ECX26E8AAE-_**		**XTAR015B21A_**
	200	2	5	208		**ECX26E5EAE-_**		**ECX26E8EAE-_**		**XTAR015B21E_**
	230	3	5 (5)	240		**ECX26E5BAE-_**		**ECX26E8BAE-_**		**XTAR015B21B_**
	380	—	5 (7.5)	380/50 Hz		**ECX26E5LAE-_**		**ECX26E8LAE-_**		**XTAR015B21L_**
	460	—	10	480		**ECX26E5CAE-_**		**ECX26E8CAE-_**		**XTAR015B21C_**
	575	—	10	600		**ECX26E5DAE-_**		**ECX26E8DAE-_**		**XTAR015B21D_**
Frame F										
18	—	—	—	—	30A	**ECX26F5AAA-_**		**ECX26F8AAA-_**		**XTAR018B21A_**
	115	2	—	120		**ECX26F5AAE-_**		**ECX26F8AAE-_**		**XTAR018B21A_**
	200	2	5	208		**ECX26F5EAE-_**		**ECX26F8EAE-_**		**XTAR018B21E_**
	230	3	5 (5)	240		**ECX26F5BAE-_**		**ECX26F8BAE-_**		**XTAR018B21B_**
	380	—	7-1/2 (5)	380/50 Hz		**ECX26F5LAE-_**		**ECX26F8LAE-_**		**XTAR018B21L_**
	460	—	10	480		**ECX26F5CAE-_**		**ECX26F8CAE-_**		**XTAR018B21C_**
	575	—	15	600		**ECX26F5DAE-_**		**ECX26F8DAE-_**		**XTAR018B21D_**
Frame G										
25	—	—	—	—	50A	**ECX26G5AAA-_**		**ECX26G8AAA-_**		**XTAR025B21A_**
	115	2	—	120		**ECX26G5AAE-_**		**ECX26G8AAE-_**		**XTAR025B21A_**
	200	3	7-1/2	208		**ECX26G5EAE-_**		**ECX26G8EAE-_**		**XTAR025B21E_**
	230	5	7-1/2 (7.5)	240		**ECX26G5BAF-_**		**ECX26G8BAF-_**		**XTAR025B21B_**
	380	—	10 (10)	380/50 Hz		**ECX26G5LAF-_**		**ECX26G8LAF-_**		**XTAR025B21L_**
	460	—	15	480		**ECX26G5CAF-_**		**ECX26G8CAF-_**		**XTAR025B21C_**
	575	—	20	600		**ECX26G5DAF-_**		**ECX26G8DAF-_**		**XTAR025B21D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ Contact factory for other voltage options.

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Table 137. Class 26 — XT FVR Combination with HMCP/E (Type 4X Nonmetallic and Type 12) (Continued)

Amps	Maximum hp (kW Ratings AC-3) ①			Coil Voltage @ 60 Hz ②	HMCPE	Type 4X Nonmetallic/IP66		Type 12/IP65		Component
	Motor Voltage ④	1-Phase	3-Phase			Catalog Number ③	Price	Catalog Number ③	Price	Catalog Number ③
Frame H										
32	—	—	—	—	50A	**ECX26H5AAA-_**		**ECX26H8AAA-_**		**XTAR032B21A_**
	115	3	—	120		**ECX26H5AAF-_**		**ECX26H8AAF-_**		**XTAR032B21A_**
	200	5	10	208		**ECX26H5EAF-_**		**ECX26H8EAF-_**		**XTAR032B21E_**
	230	5	10 (10)	240		**ECX26H5BAF-_**		**ECX26H8BAF-_**		**XTAR032B21B_**
	380	—	15 (15)	380/50 Hz		**ECX26H5LAF-_**		**ECX26H8LAF-_**		**XTAR032B21L_**
	460	—	20	480		**ECX26H5CAF-_**		**ECX26H8CAF-_**		**XTAR032B21C_**
	575	—	25	600		**ECX26H5DAF-_**		**ECX26H8DAF-_**		**XTAR032B21D_**
Frame J										
40	—	—	—	—	50A	**ECX26J5AAA-_**		**ECX26J8AAA-_**		**XTAR040B11A_**
	115	3	—	120		**ECX26J5AAF-_**		**ECX26J8AAF-_**		**XTAR040B11A_**
	200	5	10	208		**ECX26J5EAF-_**		**ECX26J8EAF-_**		**XTAR040B11E_**
	230	7-1/2	15 (12.5)	240		**ECX26J5BAF-_**		**ECX26J8BAF-_**		**XTAR040B11B_**
	380	—	15 (17.5)	380/50 Hz		**ECX26J5LAF-_**		**ECX26J8LAF-_**		**XTAR040B11L_**
	460	—	30	480		**ECX26J5CAF-_**		**ECX26J8CAF-_**		**XTAR040B11C_**
	575	—	40	600		**ECX26J5DAF-_**		**ECX26J8DAF-_**		**XTAR040B11D_**
Frame K										
50	—	—	—	—	63A	**ECX26K5AAA-_**		**ECX26K8AAA-_**		**XTAR050B11A_**
	115	3	—	120		**ECX26K5AAG-_**		**ECX26K8AAG-_**		**XTAR050B11A_**
	200	7-1/2	15	208		**ECX26K5EAG-_**		**ECX26K8EAG-_**		**XTAR050B11E_**
	230	10	20 (15.5)	240		**ECX26K5BAW-_**		**ECX26K8BAW-_**		**XTAR050B11B_**
	380	—	20 (22)	380/50 Hz		**ECX26K5LAW-_**		**ECX26K8LAW-_**		**XTAR050B11L_**
	460	—	40	480		**ECX26K5CAW-_**		**ECX26K8CAW-_**		**XTAR050B11C_**
	575	—	50	600		**ECX26K5DAG-_**		**ECX26K8DAG-_**		**XTAR050B11D_**
Frame L										
65	—	—	—	—	100A	**ECX26L5AAA-_**		**ECX26L8AAA-_**		**XTAR065B11A_**
	115	5	—	120		**ECX26L5AAG-_**		**ECX26L8AAG-_**		**XTAR065B11A_**
	200	10	20	208		**ECX26L5EAG-_**		**ECX26L8EAG-_**		**XTAR065B11E_**
	230	15	25 (20)	240		**ECX26L5BAG-_**		**ECX26L8BAG-_**		**XTAR065B11B_**
	380	—	30 (30)	380/50 Hz		**ECX26L5LAG-_**		**ECX26L8LAG-_**		**XTAR065B11L_**
	460	—	50	480		**ECX26L5CAG-_**		**ECX26L8CAG-_**		**XTAR065B11C_**
	575	—	60	600		**ECX26L5DAG-_**		**ECX26L8DAG-_**		**XTAR065B11D_**

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTOB" Overload Amperage range as per motor FLA, see **Table 123**.
④ Contact factory for other voltage options.

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Wiring Diagrams

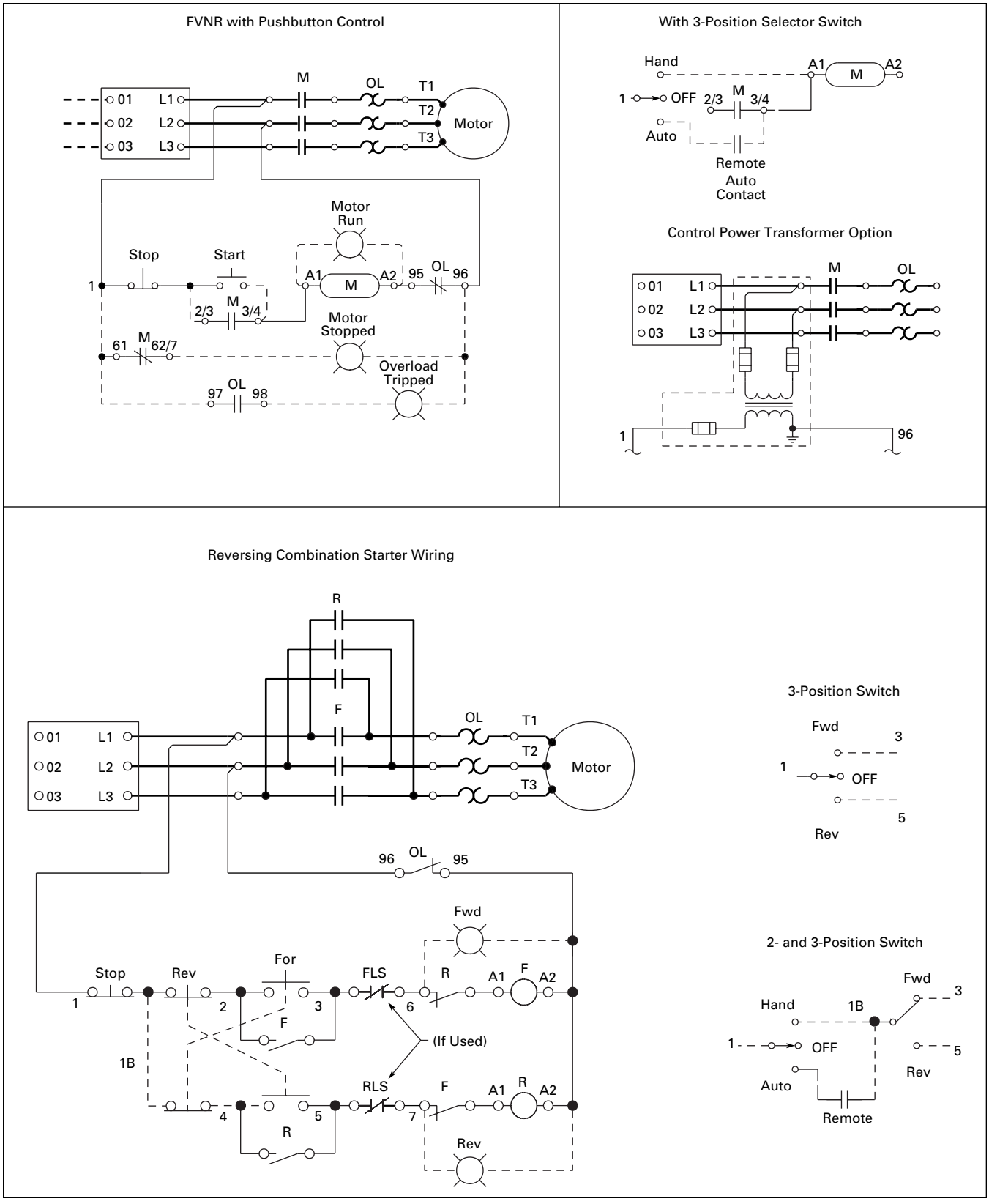

Figure 70. Typical Wiring Diagram

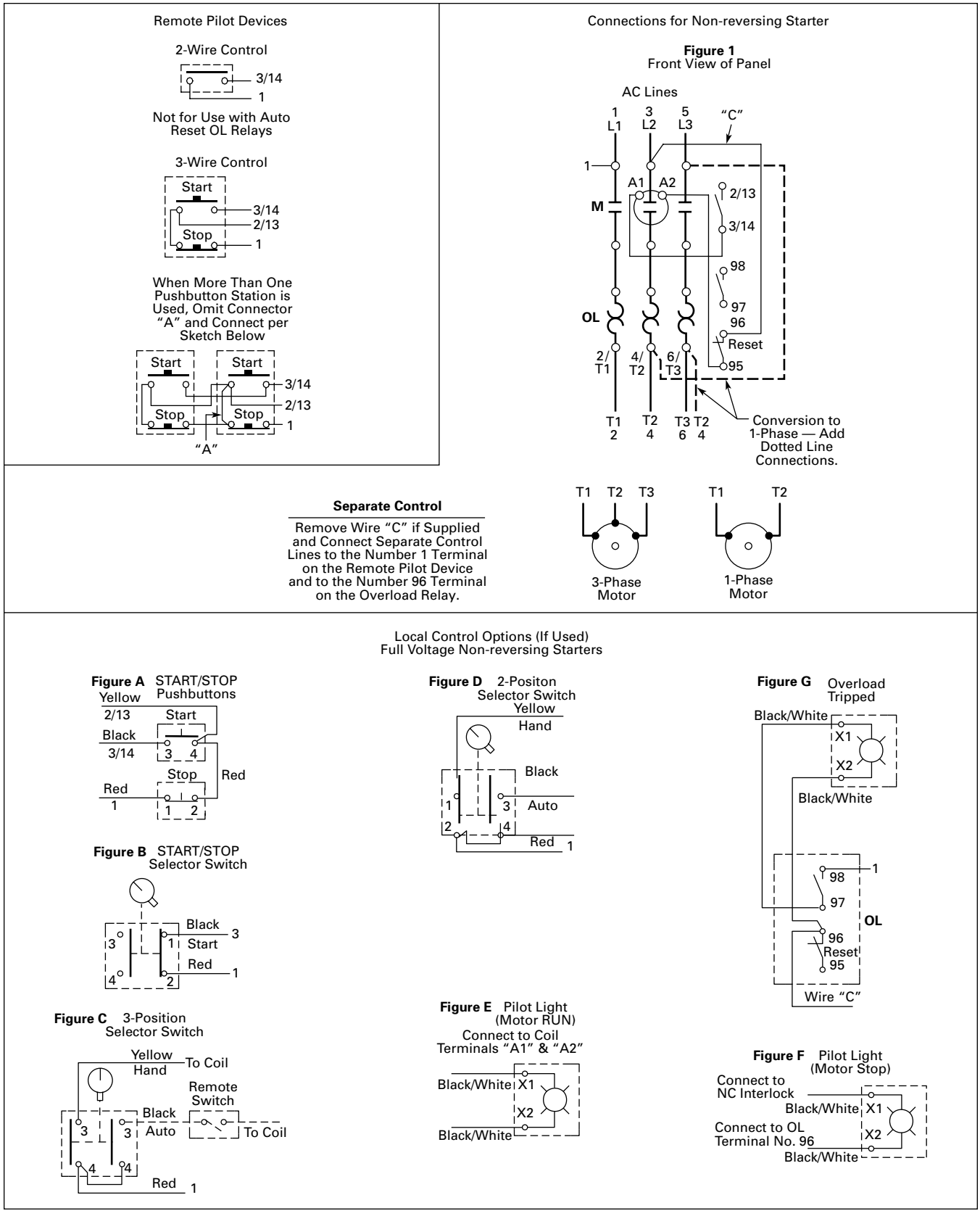

Figure 71. Typical Wiring Diagram — Non-combination Starters (Non-reversing)

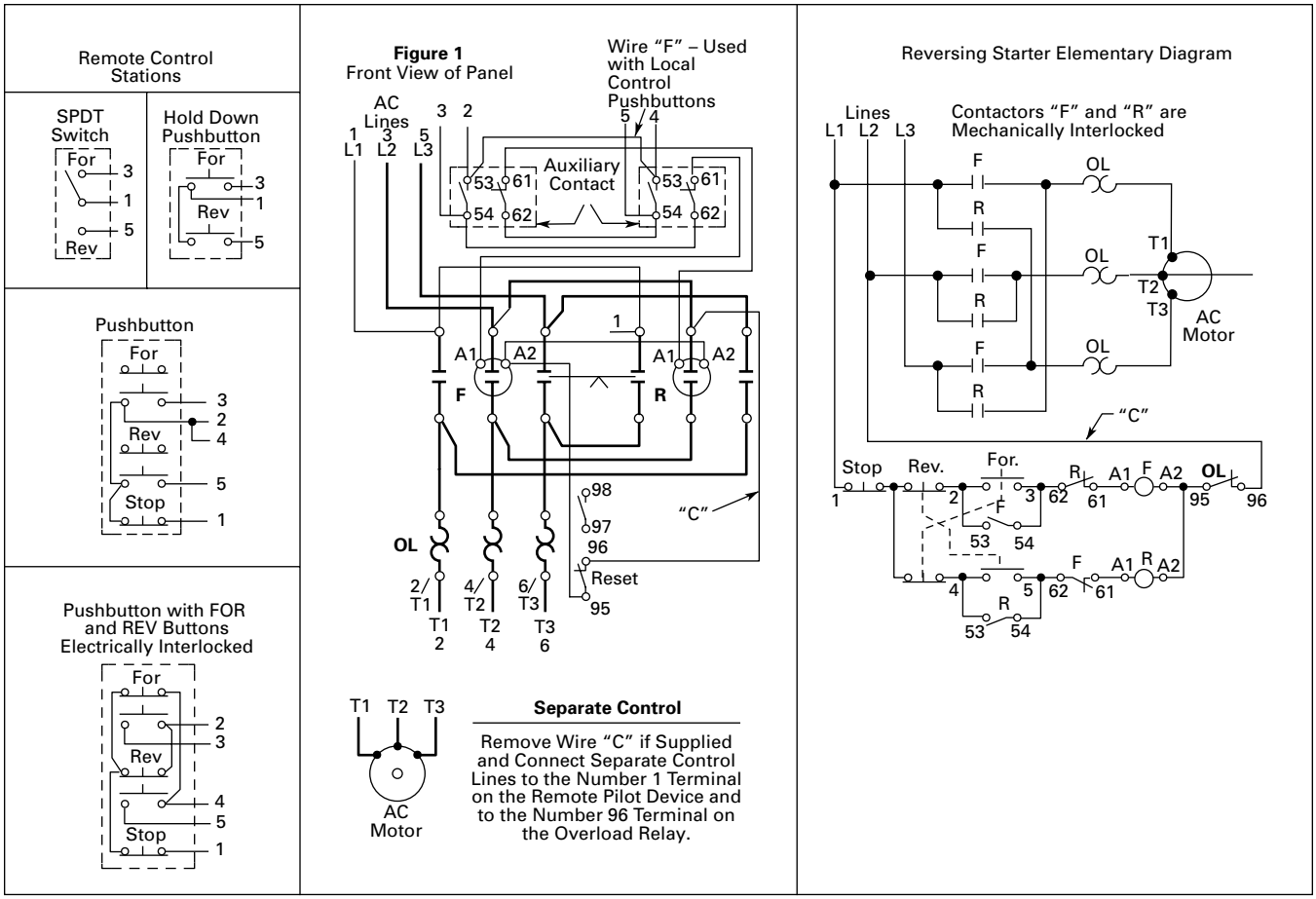

Figure 72. Typical Wiring Diagram — Non-combination Starters (Reversing)

Dimensions

Enclosure Boxes

NEMA 1, 3R, 4, 4X, 12 XT Non-combination Starters

Table 138. Class 09 — FVNR Starters (Non-combination)

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**5A**	6.4 [14]
B – H / 7 – 32A	**5P**	4.5 [10]
J – L/40 – 65A	**5A**	7.0 [16]
J – L/40 – 65A	**5P**	5.4 [12]

Table 139. Class 10 — FVR Starters (Non-combination)

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**5A**	6.8 [15]
B – H / 7 – 32A	**5P**	5.0 [11]
J – L/40 – 65A	**6A**	8.6 [19]
J – L/40 – 65A	**6P**	6.8 [15]

Table 140. Class 11 — FVNR Starters (Non-combination with CPT)

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**5A**	8.4 [19]
B – H / 7 – 32A	**5P**	6.6 [15]
J – L/40 – 65A	**6A**	9.8 [22]
J – L/40 – 65A	**6P**	7.7 [17]

NEMA 1, 3R, 4, 4X, 12 XT Fusible/Non-fusible Starters

Table 141. Class 19: FVNR Combination with Disconnect Switch

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**7A**	8.6 [19]
B – H / 7 – 32A	**7P**	6.8 [15]
J – L/40 – 65A (gG fuses)	**7A**	9.3 [21]
J – L/40 – 65A (gG fuses)	**7P**	7.5 [17]
J – L/40 – 65A (J fuses)	**8**	12 [26]
J – L/40 – 65A (J fuses)	**8P**	9.5 [21]

Table 142. Class 20: FVR Combination with Disconnect Switch

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**7A**	9.1 [20]
B – H / 7 – 32A	**7P**	7.3 [16]
J – L/40 – 65A (gG fuses)	**7A**	10 [23]
J – L/40 – 65A (gG fuses)	**7P**	8.6 [19]
J – L/40 – 65A (J fuses)	**8**	13 [28]
J – L/40 – 65A (J fuses)	**8P**	11 [24]

NEMA 1, 3R, 4, 4X, 12 XT HMCP/E Combination Starters

Table 143. Class 25: FVNR Combination with HMCP/E and CPT

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**6A**	10 [23]
B – H / 7 – 32A	**6P**	8.2 [18]
J – L/40 – 65A	**6A**	11 [24]
J – L/40 – 65A	**6P**	8.9 [20]

Table 144. Class 26: FVR Combination with HMCP/E and CPT

IEC Size (Frame / Amps)	Box Number	Ship Weight in kg [Lb]
B – H / 7 – 32A	**7A**	12 [26]
B – H / 7 – 32A	**7P**	10 [22]
J – L/40 – 65A	**7A**	13 [29]
J – L/40 – 65A	**7P**	11 [25]

Box Dimensions

For Box Dimensions, see *Enclosed Control Product Guide*, PG03300001E.

Modification Codes

Table 145. A — Ammeters, Auxiliary Contacts

Modification	Catalog Number Suffix	Description	Adder
Ammeter	**A1**	Panel Type Wired to Current Transformer in Line 1, Type 1, 12	
		Panel Type Wired to Current Transformer in Line 1, Type 3R, 4X	
	A2	Panel Type, Selector Switch and 3 Current Transformers Wired to Ammeter via Switch, Type 1, 12	
		Panel Type, Selector Switch and 3 Current Transformers Wired to Ammeter via Switch, Type 3R, 4X	
	A3	Miniature (Single-Phase), Type 1, 12	
	A4	Miniature with Selector Switch, Type 1, 12	
	A5	Switchboard (Single-Phase), Type 1, 12	
		Switchboard (Single-Phase), Type 3R, 4X	
	A6	Switchboard with Selector Switch, Type 1, 12	
		Switchboard with Selector Switch, Type 3R, 4X	
	A7	3-Panel Type (Single-Phase), Type 1, 12	
		3-Panel Type (Single-Phase), Type 3R, 4X	
	A10	3 Miniature (Single-Phase), Type 1, 3R, 4X, 12	
	A11	3 Switchboard Type (Single-Phase), Type 1, 12	
		3 Switchboard Type (Single-Phase), Type 3R, 4X	
	A12	Ammeter Order by Description, Type 1, 3R, 4X, 12	①
Top Mounted Auxiliary Contacts ② (Unwired) IEC Sizes B – L Only (Unwired) XT Series	**A13**	1NO	
	A14	1NC	
	A15	1NO-1NC	
	A16	2NO	
	A17	2NC	
	A18	2NO-1NC	
	A19	1NO-2NC	
	A20	3NO	
	A21	3NC	
	A22	3NO-1NC	
	A23	2NO-2NC	
	A24	1NO-3NC	
	A25	4NO	
	A26	4NC	

① Consult Eaton.

② Top mounted auxiliary contacts cannot be added to contactors in Box 1 (Type 1).

Table 145. A — Ammeters, Auxiliary Contacts (Continued)

Modification	Catalog Number Suffix	Description	Adder
Side Mounted Auxiliary Contacts XT Series ③	**A27**	1NO	
	A28	1NC	
	A29	1NO-1NC	
	A30	2NO	
	A31	2NC	
	A32	2NO-1NC	
	A33	1NO-2NC	
	A34	3NO	
	A35	3NC	
	A36	3NO-1NC	
	A37	2NO-2NC	
	A38	1NO-3NC	
	A39	4NO	
	A40	4NC	
Auxiliary Contacts	**A42**	Contacts Mounted on Operating Mechanism of Disconnect Switch, 1NO-1NC	
	A43	Contacts Mounted on Operating Mechanism of Disconnect Switch, 2NO-2NC	
	A44	With Auxiliary Contact Omitted	

③ Available on XT Starters for 40A and greater only.

Table 146. B — Breaker Modifications, Backspin Timer, Undervoltage Release, Bell Alarm

Modification	Catalog Number Suffix	Description	Adder
Breaker	**B1**	1NO-1NC Auxiliary Contact on Breaker	
	B2	2NO-2NC Auxiliary Contacts on Breaker	
	B3	Shunt Trip on Circuit Breaker — 48 – 127V AC or DC	
	B4	Shunt Trip on Circuit Breaker — 9 – 24V AC or DC	
	B5	Shunt Trip on Circuit Breaker — 208 – 380V AC	
	B6	Shunt Trip on Circuit Breaker — 415 – 600V AC or 220 – 250V DC	
	B8	Undervoltage Release for Breaker	
	B9	Current Limiter Mounted to Breaker	
	B10	Breaker — Order by Description	④
	B11	Thermal Magnetic Breaker	
Backspin Timer	**B12**	180 Seconds	
Undervoltage Release	**B13**	Undervoltage Release for Circuit Breaker — 208 – 240V AC	
	B14	Undervoltage Release for Circuit Breaker — 380 – 480V AC	
	B15	Undervoltage Release for Circuit Breaker — 525 – 600V AC	
Bell Alarm	**B16**	Bell Alarm for Circuit Breaker	

④ Consult Eaton.

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Table 147. C — Control Power Transformer, *IT.* Power Supplies, Control Relays, Cover Control (not elsewhere defined), Current Transformers, Compelling Relay, Control Wiring, Control Circuit Breaker, Separate Control, Customer-Supplied Components, Contactors, Counter, E-Stop Relay, Separate Source Disconnect

Modification	Catalog Number Suffix	Description	Adder
Control Power Transformers Make sure 8th character specifies primary/ secondary voltage.	**C1**	Standard Size Control Transformer, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse	
		Size A – H	
	C2	Standard Size Control Transformer, 24V/60 Hz Secondary with 2 Primary and 1 Secondary Fuse	
		Size A – H	
	C42	50 VA Extra Capacity CPT 120V/60 Hz, 110V/50 Hz with 2 Primary and1 Secondary	
		Size A – H	
	C3	100 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse	
		Size A – H	
	C4	100 VA Extra Capacity CPT, 24V/60 Hz Secondary with 2 Primary and 1 Secondary Fuse	
		Size A – H	
	C5	200 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse	
		Size A – H	
	C6	200 VA Extra Capacity CPT, 24V/60 Hz Secondary with 2 Primary and 1 Secondary Fuse	
		Size A – H	
	C7	300 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse	
		Size A – H	
	C8	400 VA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse	
		Size A – H	
	C9	1 kVA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse	
	C10	2 kVA Extra Capacity CPT, 120V/60 Hz, 110V/50 Hz Secondary with 2 Primary and 1 Secondary Fuse	
	C11	Control Transformer — Order by Description	①
	C34	CPT with Power Supply	①

① Consult Eaton.

Table 147. C — Control Power Transformer, *IT.* Power Supplies, Control Relays, Cover Control (not elsewhere defined), Current Transformers, Compelling Relay, Control Wiring, Control Circuit Breaker, Separate Control, Customer-Supplied Components, Contactors, Counter, E-Stop Relay, Separate Source Disconnect (Continued)

Modification	Catalog Number Suffix	Description	Adder
Power Supplies	**C27**	Separate Control 120V AC to 24V DC	
	C28	Power Supply with Extra Capacity — Order by Description	②
Control Relays	**C12**	4-Pole Interposing Relay, 600V (2NO/2NC)	
	C13	Run Relay, 24V DC (MVX)	
	C14	4-Pole, Unwired, A600 Rtg. — 2NO-2NC	
	C15	8-Pole, Unwired, A600 Rtg. — 4NO-4NC	
	C16	Control Relay — Order by Description	②
Cover Control	**C17**	Convert Position 7 to E30 Type Cover Control	
	C19	Lock-Off Attachment Added on Cover Control	②
	C29	Change to 10250T Cover Controls	
Current Trans-former(s)	**C21**	In Phase 1	
	C22	In Phases 1 and 2	
	C23	In 3 Phases	
Compelling Relay	**C25**	—	
Control Wiring	**C26**	Omit Control Wiring	N/C
	C30	With Separate Control Wiring and Two 250V Fuses in Holder	
	C31	With Common Control Wiring and Two 600V (Class C) Fuses in Holder	
	C33	Control Wiring Type — Order by Description	②
Control Circuit Breaker	**C32**	Order by Description	②
Separate Control	**C35**	Wired for Separate Control (Reduced Voltage)	
Customer Supplied Components	**C36**	Customer Supplied Components to Be Installed	②
	C37	Customer Supplied Wiring Diagram to Use	②
Contactor/ Starter	**C40**	Contactor/Starter — Order by Description	②
Counter	**C41**	Operations Counter	
E-Stop Relay	**C43**	E-Stop Relay (DeviceNet)	
Separate Source Disconnect	**C45**	IEC Separate Source Disconnect for Control Circuitry	②

② Consult Eaton.

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Table 148. D — Device Labels, Drain and Breather, DeviceNet

Modification	Catalog Number Suffix	Description	Adder
Device Labels	**D1**	(each label)	
Drain and Breather (Type 7/9 Enclosure)	**D5**	Drain and Breather	
	D6	Drain Only	
	D7	Breather Only	
DeviceNet	**D9**	DN65	

Table 149. E — Enclosure Modifications, Elapsed Time Meter, Duplex Outlet

Modification	Catalog Number Suffix	Description	Adder
Enclosure Modifications	**E3**	Oversize Enclosure	
	E4	Enclosure — Order by Description	①
	E5	Enclosure w/Pole Mounting Hardware	①
	E7	Service Entrance Rating with Ground/Neutral for Lighting Contactors (30 – 200A)	
	E65K	65K AIC Rated Explosion Proof Enclosure	①
	E8	Service Entrance Rating w/Ground Bar	
	E11	Safety Door Interlock	
Elapsed Time Meter	**E9**	Wired Across Coil, Type 1, 12	
		Wired Across Coil, Type 3R, 4X	
	E10	Elapsed Time Meter — Order by Description	①
Duplex Outlet	**E12**	Convenience Duplex Outlet Mounted in Side of Enclosure	
Clear Cover	**E19**	Clear Cover for Halyester Enclosure Nonmetallic	①

① Consult Eaton.

Table 150. F — Fuse Blocks

Modification	Catalog Number Suffix	Description	Adder
Fuse Blocks	**F4**	Power Fuses Included — Order by Description	②
	F5	30 Ampere Control Circuit Fuseholder (KTK) Mounted on Panel (Unwired), Fuse Not Supplied	
	F6	30 Ampere Control Circuit Fuseholder Mounted on Panel (Unwired), FNQR Fuse Supplied	
	F7	3-Pole Power Fuseholder Mounted on Front Contactor	
	F8	Separate Fusing of Control Power Supply — ***IT.***	
	F10	Blown Fuse Indicator (Not for PFC)	
	F21	Class CC Fuses	②

② Consult Eaton.

Table 151. G — Ground Fault Relay, Grounding

Modification	Catalog Number Suffix	Description	Adder
Ground Fault Relay	**G1**	Ground Fault Relay (Wired)	
	G3	Ground Fault Relay (Unwired)	
Grounding	**G5**	Special Grounding — Order by Description	③

③ Consult Eaton.

Table 152. H — Heater (Space)

Modification	Catalog Number Suffix	Description	Adder
Space Heater	**H1**	Space Heater and Thermostat	
		Size A – H, 32A	
		Size J – L, 40 – 65A	
	H2	Space Heater and NC Interlock	
		Size A – H, 32A	
		Size J – L, 40 – 65A	

Table 153. L — Lightning Arrestor, Lugs, Labels

Modification	Catalog Number Suffix	Description	Adder
Lighting Arrestor	**L3**	Installed on Panel	④
Lugs	**L9**	Special Lugs — Order by Description	④
Carton Label	**L10**	Customer Marking — Specify	④

④ Consult Eaton.

Table 154. N — Nameplates

Modification	Catalog Number Suffix	Description	Adder
Nameplates	**N1**	Enclosure Nameplates	

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Table 155. P — Pilot Lights, Pushbuttons, Phase Relays, Potential Transformers, Power Factor Correction Capacitors, Program Timer, Percentage Timer, Photocell

Modification	Catalog Number Suffix	Description	Adder
Push-to-Test Pilot Lights	**P1**	Push-to-Test Pilot Light (Red RUN) Wired to Coil	
	P2	Push-to-Test Pilot Light (Green OFF) Wired in Series with Auxiliary Contact	
	P3	Combination of **P1** and **P2** Above	
	P4	Push-to-Test Pilot Light (Amber RUN) Wired to Coil	
	P49	Push-to-Test Pilot Light (Green RUN)	
	P54	Push-to-Test Pilot Light — Red BYPASS (MVX)	
	P55	Push-to-Test Pilot Light — Amber INVERTER ENABLE (MVX)	
	P56	Push-to-Test Pilot Light — Red INVERTER RUNNING (MVX)	
	P57	Push-to-Test Pilot Light — Green STOP	
Pushbuttons	**P5**	EMERGENCY STOP — Mushroom Head	
	P6	Pushbutton Omitted	
	P7	START/STOP	
	P8	ON/OFF	
	P9	START	
	P10	ON	
	P11	OFF	
	P12	FORWARD/REVERSE/STOP	
	P13	FAST/SLOW/STOP	
	P14	FAST/OFF/SLOW	
	P15	HIGH/LOW/STOP	
	P16	HIGH/LOW	
	P17	SLOW/FAST	
	P18	Pushbutton with Legend Plate	
	P52	UP/STOP/DOWN	
	P53	OPEN/STOP/CLOSE	
	P73	START/STOP Pushbuttons Located in Top 2 Holes	
Pilot Lights	**P19**	With 1 Amber Pilot Light Marked POWER AVAILABLE Wired to Load Side of 2 Fuses or Circuit Breaker	
	P20	Pilot Light (Amber RUN) Wired to Coil	
	P21	With 1 Red Pilot Light Marked RUN Wired thru NO Auxiliary Contact	
	P22	With 1 Push-to-Test Red Light Marked RUN Wired thru NO Auxiliary Contact	
	P23	Pilot Light — Red RUN	
	P24	Pilot Light — Red ON	
	P25	Pilot Light — Green OFF	
	P26	Pilot Light — Order by Description	①
	P29	Pilot Light — Red STOP	

① Consult Eaton.

Table 155. P — Pilot Lights, Pushbuttons, Phase Relays, Potential Transformers, Power Factor Correction Capacitors, Program Timer, Percentage Timer, Photocell (Continued)

Modification	Catalog Number Suffix	Description	Adder
Pilot Lights (Continued)	**P58**	Pilot Light — Red BYPASS (MVX)	
	P61	Pilot Light — Green STOP	
	P62	FORWARD/REVERSE Red Pilot Lights	
	P63	UP/DOWN Red Pilot Lights	
	P64	OPEN/CLOSE Red Pilot Lights	
	P65	HIGH/LOW Red Pilot Lights	
	P66	FAST/SLOW Red Pilot Lights	
	P67	Green RUN Light	
	P68	LED Bulbs	
	P69	Blue OVERLOAD Light	
Illuminated Pushbutton	**P27**	Illuminated Pushbutton — Order by Description	②
Phase Loss Relay	**P28**	Phase Loss Relay	
Phase Reversal Relay	**P30**	Phase Reversal Relay	
Phase Unbalance Relay	**P32**	Phase Unbalance Relay	
Phase Monitoring Relay	**P34**	Phase Monitoring Relay	
Power Factor Correction Capacitors	**P38**	/F1 20KVAR /F2 25KVAR /F3 30KVAR /F4 35KVAR /F5 40KVAR /F6 45KVAR /F7 50KVAR /F8 60KVAR /F9 70KVAR /F10 75KVAR /F11 80KVAR /F12 90KVAR /F13 100KVAR /F14 125KVAR /F15 150KVAR /F16 175KVAR /F17 200KVAR /F18 225KVAR /F19 250KVAR /F20 300KVAR /F21 350KVAR /F22 400KVAR	
Potential Transformers	**P39**	Potential Transformer — Wired L1 – L2	
	P40	Potential Transformer — Wired L1– L2 and L2 – L3	
	P41	Potential Transformer — 3 Phases	
Program Timers	**P43**	15-Minute Program Timer	
	P44	24-Hour Program Timer	
	P45	7-Day Program Timer with Day Omission Feature	
Percentage Timers	**P47**	15-Minute Percentage Timer	
	P48	60-Minute Percentage Timer	
Photocell	**P70**	Photoelectric Receptacle with Photocell	

② Consult Eaton.

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Table 156. Q — IQ Products

Modification	Catalog Number Suffix	Description	Adder
IQ Products	**Q14**	IQ 220 with cable	
	Q1	IQ 500	
	Q3	MP3000	
	Q5	IQ 4000	
IQ Data Metering Module	**Q12**	IQ Data Metering Module	
	Q14	IQ 220 with Cable	

Table 157. R — Relays, Resets

Modification	Catalog Number Suffix	Description	Adder
Relay	**R2**	Overvoltage Relay	
	R4	Omit Overload Relay (Deduct Price)	
		00 – 0 1 2 3 4 5 – 9 **A – F G – H J – K L – M N P – S**	
	R7	Overload Relay — Order by Description	①
Resets	**R5**	Change External Reset to Internal Reset — Hole Covered with Plug	N/C
	R6	Internal Reset — No Hole Plug	N/C
	R44	Manual Reset Only on Overload Relay	
	R45	Auto Reset Only on Overload Relay	
	R71	N3R Reset Boot Added (Type 1/12 Only)	

① Consult Eaton.

Table 158. S — System Voltage, Selector Switches, Suppressor, Incomplete Sequence Protection, Single-Phase Jumper, Surge Capacitor

Modification	Catalog Number Suffix	Description	Adder
System Voltage Selection	**S1**	System Voltage Selection for Internal Components /H1 208V 60 Hz /H2 240V 60 Hz /H3 277V 60 Hz, 1-Ph /H4 480V 60 Hz /H5 600V 60 Hz /H6 796V 60 Hz /H7 220V 50 Hz /H8 380V 50 Hz /H9 415V 50 Hz /H10 550V 50 Hz /H11 660V 50 Hz /H12 380V 60 Hz /H131500V 60 Hz	N/C
	S2	System Voltage Selection — Specify on Order	N/C
Selector Switches ②	**S3**	HAND/OFF/AUTO	
	S4	HAND/AUTO	
	S5	HAND/OFF/AUTO Selector Switch with 1 Red RUN Pilot Light	
	S6	RUN/OFF/AUTO	
	S7	AUTO/OFF/TEST	
	S8	AUTO/OFF/TEST Selector Switch with 1 Red RUN Pilot Light	
	S9	AUTO/OFF/TEST Selector Switch with 1 Red RUN Pilot Light and 1 Green Pilot Light	
	S10	OFF/AUTO	
	S11	START/STOP	
	S12	OFF/ON	
	S13	HIGH/LOW	
	S14	FAST/OFF/SLOW	
	S15	SLOW/FAST	
	S16	FORWARD/REVERSE	
	S17	HIGH/OFF/LOW	
	S18	HIGH/LOW/OFF/AUTO	
	S21	HAND/OFF/AUTO Spring Return from Left	
	S41	OPEN/OFF/CLOSE	
	S42	FORWARD/OFF/REVERSE	
	S43	FAST/OFF/SLOW/AUTO	
	S45	LOCAL/REMOTE	
	S46	RUN/OFF	
	S40	Selector Switch — Order by Description	②
Suppressor	**S24**	Transient Suppressor Mounted on Magnet Coil	
Surge Suppression	**S20**	MOV (***IT.***)	
Sequence Timer	**S26**	Sequence Timer (Pump Panels)	
Sequence Protection	**S27**	Incomplete Sequence Protection	
Single Phase	**S29**	Convert Contactor or Starter from Three-Phase to Single-Phase — Install Jumper	
	S30	Single-Phase Rev. 120V	
	S31	Single-Phase Rev. 240V	
Surge Capacitor	**S37**	Surge Capacitor Wired to Disconnect Line Side	

② Consult Eaton.

Discount Symbol **MC7**

Table 159. T — Timers, Time Delay Relays, Terminal Blocks, Terminal Points, Ring Lug Connections

Modification	Catalog Number Suffix	Description	Adder
Timers	**T1**	Pneumatic Timer Installed on Contactor, Unwired, 30 Sec. Max.	
	T2	Pneumatic Timer Installed on Contactor, Unwired, 180 Sec. Max.	
	T3	Pneumatic Timer Mounted in Enclosure, Unwired, 180 Sec. Max.	
	T25	Timer — Order by Description	①
Time Delay Relays	**T6**	Time Delay Relay, 3 Minutes Maximum, Unwired, ON DELAY	
	T7	Time Delay Relay, 3 Minutes Maximum, Unwired, OFF DELAY	
	T8	Time Delay Low Voltage Release Relay	
Terminal Blocks	**T9**	With 1 Single Circuit Terminal Block, Unwired	
	T10	With 2 Single Circuit Terminal Block, Unwired	
	T24	Power Terminal Block for DeviceNet Overload	
Terminal Points	**T11**	With 6 Terminal Points, Unwired	
	T12	With 12 Terminal Points, Unwired	
	T13	With 18 Terminal Points, Unwired	
	T14	Terminal Point per Customer Specification, Unwired (Price Each)	
	T15	Terminal Point per Customer Specification, Wired (Price Each)	
	T21	3 Terminals Mounted Between Contactor and Overload for Power Factor Capacitors — Sizes 0 – 2	
	T22	3 Terminals Mounted Between Contactor and Overload for Power Factor Capacitors — Sizes 3 – 4	
Ring Lug Connectors	**T16**	Ring Lug Connections on Power Wires	
	T17	Ring Lug Connections on Control Wires	①

① Consult Eaton.

Table 160. U — Undervoltage Relay, Time Delay Undervoltage Relay

Modification	Catalog Number Suffix	Description	Adder
Undervoltage Relays	**U2**	Undervoltage Relay, Adjustable	
Time Delay Undervoltage Relays	**U4**	Time Delay Undervoltage Relay, Non-adjustable	
	U5	Time Delay Undervoltage Relay, Adjustable	
Under- and Overvoltage Relay	**U7**	Under- and Overvoltage Relay	

Table 161. V — Voltmeter

Modification	Catalog Number Suffix	Description	Adder
Voltmeters	**V1**	1 Panel Type Voltmeter Wired L1 – L2	
	V2	Panel Type Voltmeter and Selector Switch Wired to Read Three Line Voltages	
	V3 ②	Miniature Voltmeter Wired L1 – L2	
	V4 ②	Miniature Voltmeter and Selector Switch Wired to Read Three Line Voltages	
	V5	Switchboard Type Voltmeter Wired L1 – L2	
	V6 ②	Switchboard Type Voltmeter and Selector Switch Wired to Read Three Line Voltage	
	V7	3 Panel Type Voltmeters Wired in Each Phase	
	V8 ②	3 Miniature Voltmeters Wired in Each Phase	
	V9	3 Switchboard Type Voltmeters Wired in Each Phase	
	V10	Voltmeter — Order by Description	③

② Type 1/12 only.
③ Consult Eaton.

Table 162. W — Wattmeter, Watt-Hour Meter, Wiremarkers, Wiring Diagram

Modification	Catalog Number Suffix	Description	Adder
Wattmeter ④	**W1**	Wattmeter	
Watt-Hour Meter ④	**W5**	Watt-Hour Meter with Demand Attachment	
Wiremarkers	**W7**	Wiremarkers	
	W8	Wiremarkers — Order per Customer Diagram or Specifications	⑤
	W9	Wiremarkers — Order by Description	⑤
Wiring Diagram	**W12**	Reduced Copy of Custom Wiring Diagram Laminated on Inside of Door	

④ Type 1/12 only.
⑤ Consult Eaton.

Discount Symbol **MC7**

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Pushbutton

B-Frame

Rotary

B-Frame

D-Frame

Product Description

Eaton's new XT family of Manual Motor Protectors (MMPs) features a pushbutton or rotary ON/OFF manual disconnect, Class 10 adjustable bimetallic overload relay and fixed magnetic short circuit trip capability in one compact unit. Two frame sizes are available: Frame B (45 mm) for motors with FLA ratings up to 32A and Frame D (55 mm) covers motor FLA ratings up to 63A.

Application Description

The XTPB and XTPR MMPs can be used in the following applications.

Motor Protective Circuit Breaker

In many countries outside of the United States and Canada, especially Europe, the MMPs are tested and classified as thermal magnetic circuit breakers for use in motor branch circuits. This can be an important consideration for all companies who export their equipment and machines internationally. Both the XTPB and XTPR conform to IEC/EN 60947 and have the CE Mark.

Manual Motor Protectors

The XTPB and XTPR MMPs are UL Listed under UL 508 as Manual Motor Controllers. They provide an economical solution for applications requiring simple manual starting and stopping of motors. When used as an MMP, they are typically installed in an enclosure. Many enclosures are offered as accessories for the MMPs. Separate short-circuit protective devices, such as circuit breakers or fuses, are wired ahead of the MMPs. The short-circuit protective device should be sized per the NEC code and should not exceed 400% of the maximum FLA dial setting of the MMP.

Group Motor Installations

A Group Motor Installation can be defined as more than one motor circuit protected by a single set of fuses or circuit breaker on a motor branch circuit. This eliminates the need for individual fuses or circuit breakers for each motor circuit. Substantial component cost savings, panel space savings and reduced wiring installation time can be achieved in Group Motor Installations.

The MMPs are Listed as UL 508, Type E Self-Protected Manual Combination Starters. If remote operation is required, a magnetic contactor can be wired in series with the MMP. See **Figure 73**.

Article 430.53 of the National Electric Code contains the rules and requirements for Group Motor Installations. Refer to Application Note AP03402001E for NEC requirement for group motor installation.

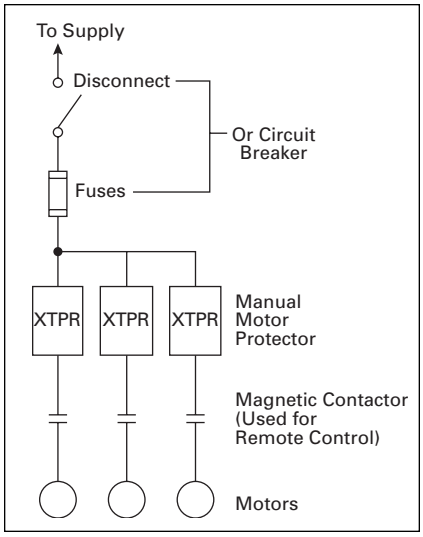


Figure 73. Group Motor Installation NEC 430-53

See Application Note — AP03402001E.

Protection in Different Controller Types

A UL 508 Type E Self-protected Manual Combination Starter/Motor Controller consists of a single device having integral short circuit protection, a main set of contacts, motor overload protection, and may also include a UL listed Line Side Adapter (See **Figure 74**). This type of controller is a legitimate short circuit protective device and disconnect means for the downstream motor. It does require an upstream feeder short circuit protective device, but does not require a dedicated branch circuit protection or a disconnect means. A UL 508 Type E rating means that the unit clears a fault and does not experience any welding of the power poles. A UL 508 Type E self-protected manual combination starter will remain fully functional should a short circuit within its ratings occur.

A UL 508 Type F Self-protected Combination Motor Controller consists of a UL 508 Listed Type E Self-protected Manual Combination Starter/Motor Controller, a UL Listed Contactor, and possibly a UL Listed Line Side Adapter. While the Type E self-protected manual motor controller of this combination motor controller device is a legitimate short circuit protective device and disconnect means for the downstream motor, the contactor is *not* "self-protected." *E.g.* XTCE007 – XTCE065.

In addition, as a complete assembly or modular components, the device should have Type 2 Coordination certification. Type 2 Coordination means the Starter or the Controller must exhibit little or no damage following a major short circuit fault and should be able to be returned to proper service without replacing any parts.

Component in a Combination Motor Controller

The XTPB and XTPR MMPs can also be wired in series with a magnetic contactor to complete the assembly of a remotely operated, combination motor controller.

Features

- ON/OFF Rotary Handle with Lockout Provision
- Visible Trip Indication
- Class 10 Overload Protection
- Phase Loss Sensitivity
- Ambient Temperature Compensation to IEC/EN 60947, VDE 0660
- Fixed Short Circuit Trip — 14 times maximum setting of overload FLA dial
- Type 2 Coordination per IEC 947
- Identification Markers Standard on Starter Faceplate
- Motor Applications from 0.1A to 63A
- Built-in heater and magnetic trip elements to protect the motor
- Adjustment dial for setting motor FLA
- DIN Rail Mount
- Terminal Types Available:
  - Screw terminals
  - Screw (line) and Spring Cage (load) terminals
  - Spring Cage terminals
- Accessories include:
  - Front and Side Auxiliary Contacts
  - Trip Indicating Contacts
  - Tamperproof Cover for OLR Dial
  - Undervoltage Release
  - Shunt Trip
  - Thru-the-Door Operators
  - Enclosures
  - 3-Phase Line Side Connecting Links

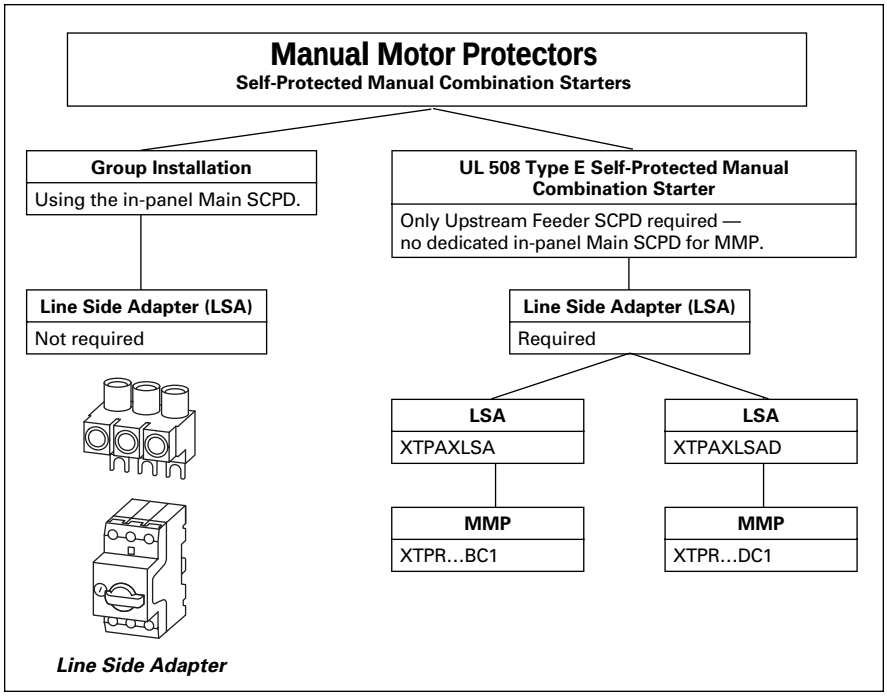


Figure 74. Line Side Adapters — When to Use Them

Note: Line Side Adapters are not required for non-US applications. Most countries outside of the US classify the MMP as a thermal magnetic circuit breaker.

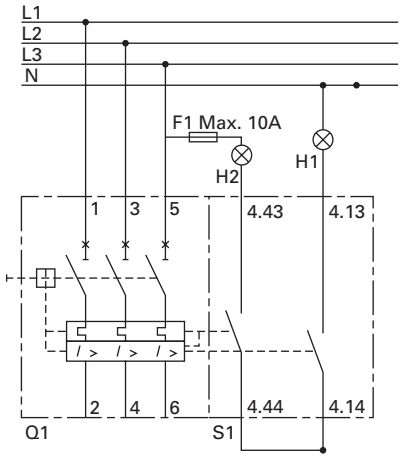
Standards and Certifications

- UL Listed
- UL 508 Group Motor and Type E Compliant
- IEC/EN 60947
- CSA File LR12530, Class 3211-05
- DIN VDE 0660 Part 100, Part 101 and Part 102

Types (Configurations)

- Motor Protective Device with Thermal and Magnetic Trip
  - XTPB Pushbutton Actuated Manual Motor Protector up to 25A
  - XTPR Rotary Actuated Manual Motor Protector up to 63A
- For the Protection of Transformers with a high inrush current:
  - XTPT Manual Transformer Protector up to 25A
- Motor Protective Device without Overload Function:
  - XTPM Motor Protective Circuit Breaker up to 32A — not UL Approved

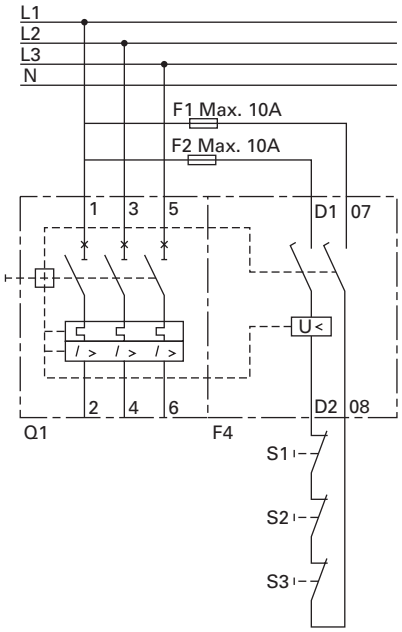
MMP with XTPAXSATR20 Signalling switch.
Separate "Short-Circuit" and "Tripped" signals.



H1: "Short-Circuit" Signal
H2: "Tripped" Signal
(MMP can be tripped by overload, short-circuit, or auxiliary releases)

H1; H2	Indicator Lights
F1	Fuses
Q1	MMP
S1	Signalling Contact

Interruption of MMPs by means of pushbutton or EMERGENCY-STOP button in the system.



The undervoltage release with leading auxiliary contacts prevents formation of parasitic voltages in the control circuit when the MMP position is "OFF". In the tripped position of the MMP, opening of these contacts is not assured.

F1; F2	Fuses
Q1	MMP
F4	Undervoltage Release
S1; S2; S3	OFF Pushbuttons in the System

Figure 75. Typical Circuits

Catalog Number Selection

Table 163. XT— Catalog Numbering System

XT PR 012 B C1

Designation
XT = XT IEC Power Control

Type
PB = Manual Motor Protector — Pushbutton
PR = Manual Motor Protector — Rotary
PM = Manual Motor Protector — Magnetic Only
PT = Manual Transformer Protector (High Mag.)

Trip Class
C1 = Class 10
Blank = Magnetic only (No thermal trip)

Frame Size	
B = 45 mm	**D** = 55 mm

Current Ratings	
B Frame	
P16 = 0.16A	**6P3** = 6.3A
P25 = 0.25A	**010** = 10A
P40 = 0.40A	**012** = 12A
P63 = 0.63A	**016** = 16A
001 = 1A	**020** = 20A
1P6 = 1.6A	**025** = 25A
2P5 = 2.5A	**032** = 32A
004 = 4A	
D Frame	
016 = 16A	**050** = 50A
025 = 25A	**058** = 58A
032 = 32A	**063** = 63A
040 = 40A	

Product Selection

Product Selection for Manual Motor Starter Applications

When ordering, specify Catalog Numbers according to the following stipulations:

XT Manual Motor Protectors are selected based on the overload current range required for a given motor. This current range is determined from the motor Full Load Ampere rating and Motor Service Factor usually found on the motor nameplate.

For motors with service factors less than 1.15, multiply the motor FLA by .90 to select appropriate MMP.

Example: For motor having FLA of 6.4A and service factor of 1.0 (6.4A x .90 = 5.76A) select Catalog Number XTPB6P3B01.

See Application Note — AP03402001E.

For motor with service factor of 1.15 or greater, use motor nameplate Full Load Amperes to select the appropriate MMP.

Example: For motor having FLA of 11A and service factor of 1.15, select Catalog Number XTPR012BC1.

B-Frame

Table 164. XTPB Pushbutton Manual Motor Protectors — Global and North American Ratings ⑤

Type 1 and Type 2 Coordination

Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current — $I_u = I_e$ (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ①									Screw Terminals	
			Maximum kW Rating AC-3 — *P* (kW)					Maximum hp Rating — *P* (hp) UL 508/CSA C 22.2 No. 14				Catalog Number	Price
			3-Phase					3-Phase					
			220 – 240V	380 – 415V	440V	500V	660 – 690V	200V	230V	460V	575V		
Frame B													
0.16	0.1 – 0.16	2.2	—	—	—	—	0.06	②	②	②	②	**XTPBP16BC1**	
0.25	0.16 – 0.25	3.5	—	0.06	0.06	0.06	0.12	②	②	②	②	**XTPBP25BC1**	
0.4	0.25 – 0.4	5.6	0.06	0.09	0.12	0.12	0.18	②	②	②	②	**XTPBP40BC1**	
0.63	0.4 – 0.63	8.8	0.09	0.12	0.18	0.25	0.25	②	②	②	②	**XTPBP63BC1**	
1	0.63 – 1	14	0.12	0.25	0.25	0.37	0.55	②	②	1/2	1/2	**XTPB001BC1**	
1.6	1 – 1.6	22	0.25	0.55	0.55	0.75	1.1	②	②	3/4	1	**XTPB1P6BC1**	
2.5	1.6 – 2.5	35	0.37	0.75	1.1	1.1	1.5	1/2	1/2	1	1-1/2	**XTPB2P5BC1**	
4	2.5 – 4	56	0.75	1.5	1.5	2.2	3	1	1	2	3	**XTPB004BC1**	
6.3	4 – 6.3	88	1.1	2.2	3	3	4	1-1/2	1-1/2	3	5	**XTPB6P3BC1**	
10	6.3 – 10	140	2.2	4	4	4	7.5	3	3	7-1/2	10	**XTPB010BC1**	
12	8 – 12	168	3	5.5	5.5	5.5	11	3	3	7-1/2	10	**XTPB012BC1**	
16	10 – 16	224	4	7.5	9	9	12.5	3 ③	5 ③	10 ③	10 ③	**XTPB016BC1**	
20	16 – 20	280	5.5	9	11	12.5	15	5 ③	5 ③	10 ③	15 ③	**XTPB020BC1** ④	
25	20 – 25	350	5.5	12.5	12.5	15	22	5 ③	7-1/2 ③	15 ③	20 ③	**XTPB025BC1** ④	

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.
② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.
③ hp rating is pending UL approval, available September 2005. Contact Eaton for availability.
④ Available September 2005. Contact Eaton for availability.
⑤ For manual motor protective circuit breaker switching capacity, see **Page 147**.

Notes:

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.
Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.
Service Factor (SF) — Setting I_r of current scale in dependence of load factor:
SF = 1.15 -> $I_r = 1 \times I_{n\ mot}$
SF = 1 -> $I_r = 0.9 \times I_{n\ mot}$

Technical Data ..... **Page 142**
Discount Symbol **MC7**

B-Frame

D-Frame

Table 165. XTPR Rotary Manual Motor Protectors with Screw Terminals — Global Ratings and North American Ratings ④

Type 1 and Type 2 Coordination

Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current — $I_u = I_e$ (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ①									Screw Terminals	
			Maximum kW Rating AC-3 — *P* (kW)					Maximum hp Rating — *P* (hp) UL 508/CSA C 22.2 No. 14				Catalog Number	Price
			3-Phase					3-Phase					
			220 – 240V	380 – 415V	440V	500V	660 – 690V	200V	230V	460V	575V		
Frame B													
0.16	0.1 – 0.16	2.2	—	—	—	—	0.06	②	②	②	②	**XTPRP16BC1**	
0.25	0.16 – 0.25	3.5	—	0.06	0.06	0.06	0.12	②	②	②	②	**XTPRP25BC1**	
0.4	0.25 – 0.4	5.6	0.06	0.09	0.12	0.12	0.18	②	②	②	②	**XTPRP40BC1**	
0.63	0.4 – 0.63	8.8	0.09	0.12	0.18	0.25	0.25	②	②	②	②	**XTPRP63BC1**	
1	0.63 – 1	14	0.12	0.25	0.25	0.37	0.55	②	②	1/2	1/2	**XTPR001BC1**	
1.6	1 – 1.6	22	0.25	0.55	0.55	0.75	1.1	②	②	3/4	1	**XTPR1P6BC1**	
2.5	1.6 – 2.5	35	0.37	0.75	1.1	1.1	1.5	1/2	1/2	1	1-1/2	**XTPR2P5BC1**	
4	2.5 – 4	56	0.75	1.5	1.5	2.2	3	1	1	2	3	**XTPR004BC1**	
6.3	4 – 6.3	88	1.1	2.2	3	3	4	1-1/2	1-1/2	3	5	**XTPR6P3BC1**	
10	6.3 – 10	140	2.2	4	4	4	7.5	3	3	7-1/2	10	**XTPR010BC1**	
12	8 – 12	168	3	5.5	5.5	5.5	11	3	3	7-1/2	10	**XTPR012BC1**	
16	10 – 16	224	4	7.5	9	9	12.5	3	5	10	10	**XTPR016BC1**	
20	16 – 20	280	5.5	9	11	12.5	15	5	5	10	15	**XTPR020BC1**	
25	20 – 25	350	5.5	12.5	12.5	15	22	5	7-1/2	15	20	**XTPR025BC1**	
32	25 – 32	448	7.5	15	15	22	30	7-1/2	10	25	30	**XTPR032BC1**	
Frame D													
16	10 – 16	224	4	7.5	9	9	12.5	3	5	10	15	**XTPR016DC1**	
25	16 – 25	350	5.5	12.5	12.5	12.5	22	7-1/2	7-1/2	20	25	**XTPR025DC1**	
32	25 – 32	448	7.5	15	17.5	17.5	22	10	10	25	30	**XTPR032DC1**	
40	32 – 40	560	11	20	22	22	30	10	15	30	40	**XTPR040DC1**	
50	40 – 50	700	14	25	30	30	45	10 ③	15 ③	30 ③	40 ③	**XTPR050DC1**	
58	50 – 58	812	17	30	37	37	55	10 ③	15 ③	30 ③	40 ③	**XTPR058DC1**	
65	55 – 63	882	18.5	34	37	37	55	15 ③	15 ③	40 ③	50 ③	**XTPR063DC1**	

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.

② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.

③ Ratings pending UL approval. Contact Eaton for availability.

④ For manual motor protective circuit breaker switching capacity, see **Page 147**.

Notes:

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.
Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.
Service Factor (SF) — Setting I_r of current scale in dependence of load factor:

SF = 1.15 -> $I_r = 1 \times I_{n\ mot}$

SF = 1 -> $I_r = 0.9 \times I_{n\ mot}$

Technical Data . . . . . **Page 142**
Discount Symbol **MC7**

Table 166. XTPR Manual Motor Protectors with Screw (Line) and Spring Cage (Load) Terminals — Global and North American Ratings ③

Type 1 and Type 2 Coordination

Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current — $I_u = I_e$ (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ①									Screw (Line) & Spring Cage (Load) Terminals	
			Maximum kW Rating AC-3 — *P* (kW)					Maximum hp Rating — *P* (hp) UL 508/CSA C 22.2 No. 14				Catalog Number	Price
			3-Phase					3-Phase					
			220 – 240V	380 – 415V	440V	500V	660 – 690V	200V	230V	460V	575V		
Frame B													
0.16	0.1 – 0.16	2.2	—	—	—	—	0.06	②	②	②	②	**XTPRSCP16BC1**	
0.25	0.16 – 0.25	3.5	—	0.06	0.06	0.06	0.12	②	②	②	②	**XTPRSCP25BC1**	
0.4	0.25 – 0.4	5.6	0.06	0.09	0.12	0.12	0.18	②	②	②	②	**XTPRSCP40BC1**	
0.63	0.4 – 0.63	8.8	0.09	0.12	0.18	0.25	0.25	②	②	②	②	**XTPRSCP63BC1**	
1	0.63 – 1	14	0.12	0.25	0.25	0.37	0.55	②	②	1/2	1/2	**XTPRSC001BC1**	
1.6	1 – 1.6	22	0.25	0.55	0.55	0.75	1.1	②	②	3/4	1	**XTPRSC1P6BC1**	
2.5	1.6 – 2.5	35	0.37	0.75	1.1	1.1	1.5	1/2	1/2	1	1-1/2	**XTPRSC2P5BC1**	
4	2.5 – 4	56	0.75	1.5	1.5	2.2	3	1	1	2	3	**XTPRSC004BC1**	
6.3	4 – 6.3	88	1.1	2.2	3	3	4	1-1/2	1-1/2	3	5	**XTPRSC6P3BC1**	
10	6.3 – 10	140	2.2	4	4	4	7.5	3	3	7-1/2	10	**XTPRSC010BC1**	
12	8 – 12	168	3	5.5	5.5	5.5	11	3	3	7-1/2	10	**XTPRSC012BC1**	
16	10 – 16	224	4	7.5	9	9	12.5	3	5	10	10	**XTPRSC016BC1**	

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.

② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.

③ For manual motor protective circuit breaker switching capacity, see **Page 147**.

Table 167. XTPR Manual Motor Protectors with Spring Cage Terminals — Global and North American Ratings ⑥

Type 1 and Type 2 Coordination

Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current — $I_u = I_e$ (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ④									Spring Cage Terminals	
			Maximum kW Rating AC-3 — *P* (kW)					Maximum hp Rating — *P* (hp) UL 508/CSA C 22.2 No. 14				Catalog Number	Price
			3-Phase					3-Phase					
			220 – 240V	380 – 415V	440V	500V	660 – 690V	200V	230V	460V	575V		
Frame B													
0.16	0.1 – 0.16	2.2	—	—	—	—	0.06	⑤	⑤	⑤	⑤	**XTPRCP16BC1**	
0.25	0.16 – 0.25	3.5	—	0.06	0.06	0.06	0.12	⑤	⑤	⑤	⑤	**XTPRCP25BC1**	
0.4	0.25 – 0.4	5.6	0.06	0.09	0.12	0.12	0.18	⑤	⑤	⑤	⑤	**XTPRCP40BC1**	
0.63	0.4 – 0.63	8.8	0.09	0.12	0.18	0.25	0.25	⑤	⑤	⑤	⑤	**XTPRCP63BC1**	
1	0.63 – 1	14	0.12	0.25	0.25	0.37	0.55	⑤	⑤	1/2	1/2	**XTPRC001BC1**	
1.6	1 – 1.6	22	0.25	0.55	0.55	0.75	1.1	⑤	⑤	3/4	1	**XTPRC1P6BC1**	
2.5	1.6 – 2.5	35	0.37	0.75	1.1	1.1	1.5	1/2	1/2	1	1-1/2	**XTPRC2P5BC1**	
4	2.5 – 4	56	0.75	1.5	1.5	2.2	3	1	1	2	3	**XTPRC004BC1**	
6.3	4 – 6.3	88	1.1	2.2	3	3	4	1-1/2	1-1/2	3	5	**XTPRC6P3BC1**	
10	6.3 – 10	140	2.2	4	4	4	7.5	3	3	7-1/2	10	**XTPRC010BC1**	
12	8 – 12	168	3	5.5	5.5	5.5	11	3	3	7-1/2	10	**XTPRC012BC1**	
16	10 – 16	224	4	7.5	9	9	12.5	3	5	10	10	**XTPRC016BC1**	

④ Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.

⑤ In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.

⑥ For manual motor protective circuit breaker switching capacity, see **Page 147**.

Notes:

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.

Service Factor (SF) — Setting I_r of current scale in dependence of load factor:

SF = 1.15 -> $I_r = 1 \times I_{n\ mot}$

SF = 1 -> $I_r = 0.9 \times I_{n\ mot}$

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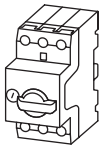
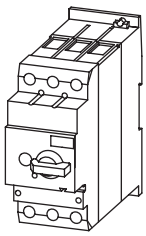
Technical Data ..... **Page 142**
Discount Symbol **MC7**



B-Frame



D-Frame

Table 168. XTPR Manual Self-Protected Motor Starters — North American Ratings, UL 508 Type E ③

Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current — I_u (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ① Maximum hp Rating — *P* (hp) 3-Phase 200V	230V	460V	575V	Rated Short-Circuit Breaking Capacity (kA) 240V	480/277V	600/347V	Line Side Adapter ③ Catalog Number	Price	Manual Motor Protector — Screw Terminals Catalog Number	Price
Frame B													
0.16	0.1 – 0.16	2.2	②	②	②	②	50	50	50	**XTPAXLSA**		**XTPRP16BC1**	
0.25	0.16 – 0.25	3.4	②	②	②	②	50	50	50	**XTPAXLSA**		**XTPRP25BC1**	
0.4	0.25 – 0.4	5.6	②	②	②	②	50	50	50	**XTPAXLSA**		**XTPRP40BC1**	
0.63	0.4 – 0.63	8.8	②	②	②	②	50	50	50	**XTPAXLSA**		**XTPRP63BC1**	
1	0.63 – 1	14	②	②	1/2	1/2	50	50	50	**XTPAXLSA**		**XTPR001BC1**	
1.6	1 – 1.6	22	②	②	3/4	1	50	50	50	**XTPAXLSA**		**XTPR1P6BC1**	
2.5	1.6 – 2.5	35	1/2	1/2	1	1-1/2	50	50	50	**XTPAXLSA**		**XTPR2P5BC1**	
4	2.5 – 4	56	1	1	2	3	50	50	50	**XTPAXLSA**		**XTPR004BC1**	
6.3	4 – 6.3	88	1-1/2	1-1/2	3	5	50	50	50	**XTPAXLSA**		**XTPR6P3BC1**	
10	6.3 – 11	140	3	3	7-1/2	10	50	50	50	**XTPAXLSA**		**XTPR010BC1**	
12	8 – 12	168	3	3	7-1/2	10	42	42	—	**XTPAXLSA**		**XTPR012BC1**	
16	10 – 16	224	3	5	10	10	42	42	—	**XTPAXLSA**		**XTPR016BC1**	
20	16 – 20	280	5	5	10	15	18	18	—	**XTPAXLSA**		**XTPR020BC1**	
25	20 – 25	350	5	7-1/2	15	20	18	18	—	**XTPAXLSA**		**XTPR025BC1**	
32	25 – 32	448	7-1/2	10	25	30	18	18	—	**XTPAXLSA**		**XTPR032BC1**	
Frame D													
16	10 – 16	224	3	5	10	15	50	50	10	**XTPAXLSAD**		**XTPR016DC1**	
25	16 – 25	224	5	7-1/2	20	25	50	50	10	**XTPAXLSAD**		**XTPR025DC1**	
32	25 – 32	350	7-1/2	10	25	30	50	50	10	**XTPAXLSAD**		**XTPR032DC1**	
40	32 – 40	448	10	15	30	40	50	50	10	**XTPAXLSAD**		**XTPR040DC1**	

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.

② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.

③ UL 508 Type E starters are assembled from a standard XTPR and a special incoming terminal Line Side Adapter (XTPAXLSA or XTPAXLSAD).

Notes:

A UL 508 Type E Self-Protected Manual Combination Starter (XTPR) consists of a Manual Motor Protector (XTPR) and a UL Listed Line Side Adapter (e.g. XTPAXLSA). The Type E Self-Protected Manual Combination Starter alone is a legitimate short-circuit protective device and disconnect means for the down-stream motor, while the contactor has been added to provide remote operation of the motor circuit.

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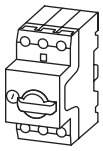
Technical Data ..... **Page 142**
Discount Symbol **MC7**



B-Frame

Table 169. XTPT Transformer Protective Circuit Breakers — Global and North American Ratings ④

Type 1 and Type 2 Coordination

For the protection of transformers with a high inrush current. Fixed short-circuit trip of 15 – 22 times max. settings of FLA

Rated Uninterrupted Current — I_u (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ①									Screw Terminals	
			Maximum kW Rating AC-3 — *P* (kW)					Maximum hp Rating — *P* (hp) UL 508/CSA C 22.2 No. 14 ③				Catalog Number	Price
			3-Phase					3-Phase					
			220 – 240V	380 – 415V	440V	500V	660 – 690V	200V	230V	460V	575V		
Frame B													
0.16	0.1 – 0.16	2.4	—	—	—	—	0.06	②	②	②	②	**XTPTP16BC1**	
0.25	0.16 – 0.25	4.25	—	0.06	0.06	0.06	0.12	②	②	②	②	**XTPTP25BC1**	
0.4	0.25 – 0.4	6.8	0.06	0.09	0.12	0.12	0.18	②	②	②	②	**XTPTP40BC1**	
0.63	0.4 – 0.63	11.97	0.09	0.12	0.18	0.25	0.25	②	②	②	②	**XTPTP63BC1**	
1	0.63 – 1	20	0.12	0.25	0.25	0.37	0.55	②	②	1/2	1/2	**XTPT001BC1**	
1.6	1 – 1.6	32	0.25	0.55	0.55	0.75	1.1	②	②	3/4	1	**XTPT1P6BC1**	
2.5	1.6 – 2.5	50	0.37	0.75	1.1	1.1	1.5	1/2	1/2	1	1-1/2	**XTPT2P5BC1**	
4	2.5 – 4	84	0.75	1.5	1.5	2.2	3	1	1	2	3	**XTPT004BC1**	
6.3	4 – 6.3	141	1.1	2.2	3	3	4	1-1/2	1-1/2	3	5	**XTPT6P3BC1**	
10	6.3 – 10	224	2.2	4	4	4	7.5	3	3	7-1/2	10	**XTPT010BC1**	
12	8 – 12	224	3	5.5	5.5	5.5	11	3	3	7-1/2	10	**XTPT012BC1**	
16	10 – 16	358	4	7.5	9	9	12.5	3	5	10	10	**XTPT016BC1**	
20	16 – 20	380	5.5	9	11	12.5	15	5	5	10	15	**XTPT020BC1**	
25	20 – 25	420	5.5	12.5	12.5	15	22	5	7-1/2	15	20	**XTPT025BC1**	

① Select Manual Transformer Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.

② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.

③ XTPT can be used also for transformer protection, provided the Pub51226 note label is applied next to the fitted device.

④ For manual motor protective circuit breaker switching capacity, see **Page 147**.

Notes:

For the protection of transformers with a high inrush current.
Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.
Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.
Service Factor (SF) — Setting I_r of current scale in dependence of load factor:

SF = 1.15 -> $I_r = 1 \times I_{n\ mot}$
SF = 1 -> $I_r = 0.9 \times I_{n\ mot}$

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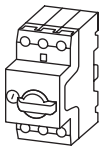
Technical Data ..... **Page 142**
Discount Symbol **MC7**



B-Frame

Table 170. XTPM Motor Protective Circuit Breakers for Starter Combinations — Global Ratings
Type 1 and Type 2 Coordination
Motor Protective Device without Overload Function

Rated Uninterrupted Current — I_u (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ①									Screw Terminals	
			Maximum kW Rating AC-3 — *P* (kW)					Maximum hp Rating — *P* (hp) ②				Catalog Number	Price
			3-Phase					3-Phase					
			220 – 240V	380 – 415V	440V	500V	660 – 690V	200V	230V	460V	575V		
Frame B													
0.16	—	2.2	—	—	—	—	0.06	—	—	—	—	**XTPMP16B**	
0.25	—	3.5	—	0.06	0.06	0.06	0.12	—	—	—	—	**XTPMP25B**	
0.4	—	5.6	0.06	0.09	0.12	0.12	0.18	—	—	—	—	**XTPMP40B**	
0.63	—	8.8	0.09	0.12	0.18	0.25	0.25	—	—	—	—	**XTPMP63B**	
1	—	14	0.12	0.25	0.25	0.37	0.55	—	—	—	—	**XTPM001B**	
1.6	—	22	0.25	0.37	0.55	0.75	1.1	—	—	—	—	**XTPM1P6B**	
2.5	—	35	0.37	0.75	1.1	1.1	1.5	—	—	—	—	**XTPM2P5B**	
4	—	56	0.75	1.5	1.5	2.2	3	—	—	—	—	**XTPM004B**	
6.3	—	88	1.1	2.2	3	3	4	—	—	—	—	**XTPM6P3B**	
10	—	140	2.2	4	4	4	7.5	—	—	—	—	**XTPM010B**	
12	—	168	3	5.5	5.5	5.5	11	—	—	—	—	**XTPM012B**	
16	—	224	4	7.5	9	9	12.5	—	—	—	—	**XTPM016B**	
20	—	280	5.5	9	11	12.5	15	—	—	—	—	**XTPM020B**	
25	—	350	5.5	12.5	12.5	15	22	—	—	—	—	**XTPM025B**	
32	—	448	7.5	15	15	22	30	—	—	—	—	**XTPM032B**	

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.
② XTPM is not UL Approved.

Notes:

Can be snap-fit to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height
An appropriate overload relay must be fitted to protect motors against overload.
Combinations of the XTPM Manual Motor Protectors and XTCE/XTCR Contactors + XTOB Overload Relays can be found in the XT Manual and Combination Motor Controllers section.
When using the XTPM as short-circuit protection for motors with heavy starting duty, the rated operational current I_e must be derated during engineering with the following factors:

Class 5 = 1.0
Class 10 = 1.0
Class 15 = 0.82
Class 20 = 0.71
Class 25 = 0.63
Class 30 = 0.58
Class 35 = 0.53
Class 40 = 0.50

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Technical Data ..... **Page 142**
Discount Symbol **MC7**

Accessories

Auxiliary Contacts

Side-Mount Auxiliary Contacts ①

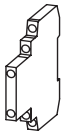
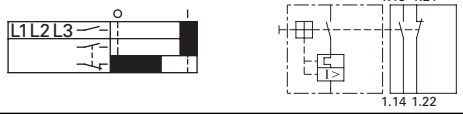
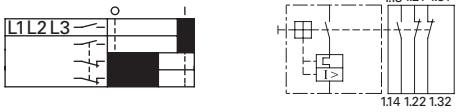
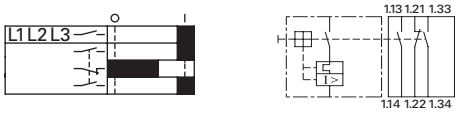


Table 171. Side-Mount Auxiliary Contacts

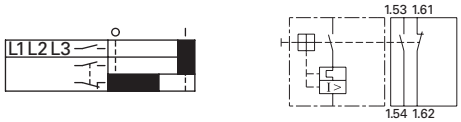
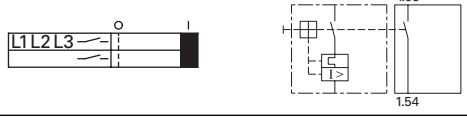
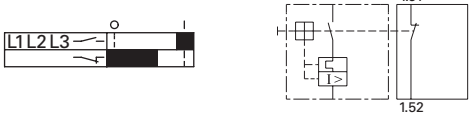
Contact Configuration	Contact Sequence	Screw Terminals		Spring Cage Terminals		Price ②
		Pkg. Qty.	Catalog Number	Pkg. Qty.	Catalog Number	
1NO-1NC		1	**XTPAXSA11**	5	**XTPAXSAC11**	
1NO-2NC		1	**XTPAXSA12**	—	**—**	
2NO-1NC		1	**XTPAXSA21**	—	**—**	

① Can be fitted on the right side of manual motor protectors and manual transformer protectors and can be combined with XTPAXSATR... and XTPAXFA... trip indicating auxiliary contact.

② Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Front-Mount Auxiliary Contacts ③

Table 172. Front-Mount Auxiliary Contacts

Contact Configuration	Contact Sequence	Screw Terminals		Spring Cage Terminals		Price ④
		Pkg. Qty.	Catalog Number	Pkg. Qty.	Catalog Number	
1NO-1NC		1	**XTPAXFA11**	—	**—**	
1NO-0NC		1	**XTPAXFA10**	5	**XTPAXFAC10**	
0NO-1NC		—	**—**	5	**XTPAXFAC01**	

③ Can be fitted to manual motor protectors and manual transformer protectors. 45 mm (XTPR...B and XTPB) or 55 mm (XTPR...D) widths of manual motor protectors remained unchanged.

④ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Discount Symbol **MC7**

Side-Mount Trip Indicating Auxiliary Contacts ①

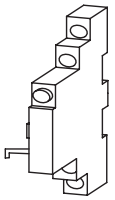
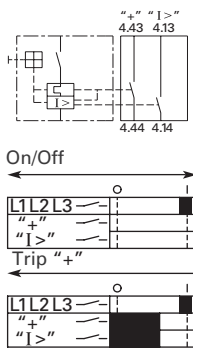
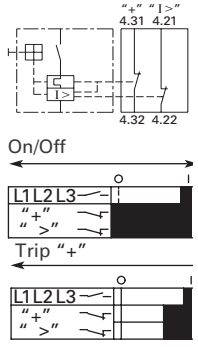


Table 173. Side-Mount Trip Indicating Auxiliary Contacts

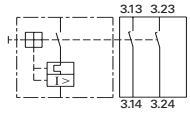
Contact Configuration	Contact Sequence	Pkg. Qty.	Catalog Number	Price ②
2 x 1NO		2	XTPAXSATR20	
2 x 1NC		2	XTPAXSATR02	

① Can be fitted on the right side of manual motor protectors. Can be combined with standard auxiliary contacts. Trip indication: A. General Trip indication (overload) B. Short-circuit trip. Local short-circuit indication by red indicator, manually resettable.

② Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Early-Make Front-Mount Auxiliary Contacts ③

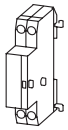
Table 174. Early-Make Front-Mount Auxiliary Contacts

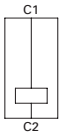
Contact Configuration	Contact Sequence	Pkg. Qty.	Catalog Number	Price ④
2NO		5	XTPBXFAEM20	
2NO		2	XTPAXFAEM20	

③ For use with XTPB..., B-Frame XTPR and XTPT. Can be fitted to the front of a manual motor protector. 45 mm width of manual motor protector remains unchanged. For early energization of undervoltage release, e.g. in Emergency-Stop circuits to EN 60204.

④ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Shunt Release ⑤





Contact Sequence

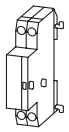
Table 175. Shunt Release

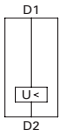
Catalog Number — Screw Terminals	Catalog Number — Spring Cage Terminals	Pkg. Qty.	Price ⑥
XTPAXSR110V50H	—	2	
XTPAXSR110VDC	—	2	
XTPAXSR120V60H	—	2	
XTPAXSR125VDC	—	2	
XTPAXSR208V60H	—	2	
XTPAXSR220V50H	—	2	
XTPAXSR220VDC	—	2	
XTPAXSR230V50H	XTPAXSRC230V50H	2	
XTPAXSR240V50H	—	2	
XTPAXSR240V60H	—	2	
XTPAXSR24V50H	—	2	
XTPAXSR24VDC	XTPAXSRC24VDC	2	
XTPAXSR250VDC	—	2	
XTPAXSR380V50H	—	2	
XTPAXSR400V50H	—	2	
XTPAXSR415V50H	—	2	
XTPAXSR440V60H	—	2	
XTPAXSR480V60H	—	2	
XTPAXSR48V50H	—	2	
XTPAXSR48VDC	—	2	
XTPAXSR60VDC	—	2	

⑤ Can be fitted on the left side of manual motor protectors. Cannot be combined with the XTPAXUVR. DC: Intermittent operation 5 sec.

⑥ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Undervoltage Release ⑦





Contact Sequence

Table 176. Early-Make Front-Mount Auxiliary Contacts

Catalog Number — Screw Terminals	Catalog Number — Spring Cage Terminals	Pkg. Qty.	Price ⑧
XTPAXUVR110V50H	—	2	
XTPAXUVR120V60H	—	2	
XTPAXUVR208V60H	—	2	
XTPAXUVR220V50H	—	2	
XTPAXUVR230V50H	XTPAXUVRC230V50H	2	
XTPAXUVR240V50H	—	2	
XTPAXUVR240V60H	—	2	
XTPAXUVR24V50H	—	2	
XTPAXUVR24V60H	—	2	
XTPAXUVR380V50H	—	2	
XTPAXUVR400V50H	—	2	
XTPAXUVR415V50H	—	2	
XTPAXUVR440V60H	—	2	
XTPAXUVR480V60H	—	2	
XTPAXUVR48V50H	—	2	
XTPAXUVR60V50H	—	2	

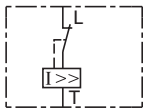
⑦ Can be fitted on left side manual motor protectors. Cannot be combined with XTPAXSR. When combined with a circuit breaker, it can be used as Emergency-Stop device to IEC/EN 60204.

⑧ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Discount Symbol **MC7**

Current Limiter ①

Table 177. Current Limiter

Description	Contact Sequence	Pkg. Qty.	Catalog Number	Price
To enhance the switching capacity of non-inherently safe 16 – 25A Manual Motor Protectors to 150 kA/ 440V		1	**XTPAXCL**	

① Max. rated operation voltage U_e = 690V, rated uninterrupted current I_u = 63A. Can be used for individual and group protection. For group protection and in combination with the XTPR...D, order additional XTPAXIT incoming terminal if required. Mounting next to or behind the manual motor protector. 16 – 63A XTPR...D: 100 kA/400V, 10 kA/690V.

Metric Cable Glands

Table 178. Metric Cable Glands

Description	Pkg. Qty.	Catalog Number	Price ②
20.5 mm Metric Cable Gland 6 – 13 mm Wire	20	**XTPAXMCG20**	
25.5 mm Metric Cable Gland 9 – 17 mm Wire	20	**XTPAXMCG25**	
32.5 mm Metric Cable Gland 13 – 21 mm Wire	10	**XTPAXMCG32**	
32.5 mm Metric Cable Gland 18 – 25 mm wire	10	**XTPAXMCG32G**	

② Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

IP65 Metric Diaphragm Grommet ③

Table 179. IP65 Metric Diaphragm Grommet

Description	Catalog Number	Pkg. Qty.	Price ④
20.5 mm Diaphragm Grommet 1 – 13 mm Wire	**XTPAXMDG20**	100	
25.5 mm Diaphragm Grommet 1 – 18 mm Wire	**XTPAXMDG25**	100	
32.5 mm Diaphragm Grommet 1 – 24 mm Wire	**XTPAXMDG32**	100	

③ With integral push-through diaphragm.

④ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

IP65 Rotary Handle Mechanism ⑤⑥

Table 180. IP65 Rotary Handle Mechanism

Description	Pkg. Qty.	Catalog Number	Price
Rotary Handle Mech IP65 Black — For use as main switch to IEC/EN 60204	1	**XTPAXRHM165B**	
Rotary Handle Mech IP65 Red/Yellow — For use as main switch with Emergency-Stop function to EN 60204	1	**XTPAXRHM265RY**	
Rotary Handle Mech IP65 Black — For use as main switch to EN 60204 in MCC power distribution systems and with B-Frame XTPR when installed rotated 90°.	1	**XTPAXRHM365B**	
Rotary Handle Mech IP65 Red/ Yellow — For use as main switch with Emergency-Stop function to EN 60204 in MCC power distribution systems and with B-Frame XTPR when installed rotated 90°.	1	**XTPAXRHM465RY**	

⑤ Plug-in Connection shaft, XTPAXRHMSFT, can be cut to desired length for mounting depths of 100 – 240 mm. Carrier with extension shaft included.

⑥ With ON/OFF switch position and "+" (tripped), lockable with 3 padlocks, 4 – 8 mm hasp.

Telescopic Adapter ⑦

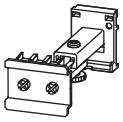


Table 181. Telescopic Adapter

Description	Pkg. Qty.	Catalog Number	Price
Telescoping Adapter, 75 – 115 mm Depth, for use with XTPB and B-Frame XTPR MMPs	1	**XTPAXTEA**	

⑦ With 45 mm top-hat rail to IEC/EN 60715 for compensation of the mounting depth of rear mounted devices in surface mounted enclosures. Stepless adjustment via scale from 75 – 115 mm.

Sealing Wire

Table 182. Sealing Wire

Description	Pkg. Qty.	Catalog Number	Price ⑧
Sealing Wire for B-Frame XTPR. To prevent tampering with the overload release and the test function	5	**XTPAXSW**	

⑧ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Discount Symbol **MC7**

Indicating Lights

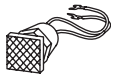


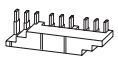
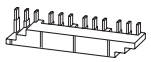
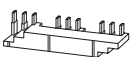
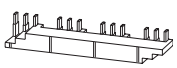
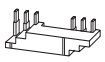
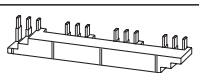
Table 183. Indicating Lights

Color	Description — Indicating Light	Pkg. Qty.	Catalog Number	Price ①
White	110 – 230V	10	**XTPAXILWB**	
	230 – 240V	10	**XTPAXILWN**	
	415 – 500V	10	**XTPAXILWC**	
Green	110 – 230V	10	**XTPAXILGB**	
	230 – 240V	10	**XTPAXILGN**	
	415 – 500V	5	**XTPAXILGC**	
Red	110 – 230V	10	**XTPAXILRB**	
	230 – 240V	10	**XTPAXILRN**	
	415 – 500V	5	**XTPAXILRC**	

① Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Three-Phase Commoning Links

Table 184. Three-Phase Commoning Links ②

	For use with…	Qty. MMP	Length of Link (mm)	Unit Width (mm)	Pkg. Qty.	Catalog Number	Price ③
Frame B							
	MMP with no side mounted auxiliaries or voltage releases	2	90	45	10	**XTPAXCLKA2**	
		3	135	45	10	**XTPAXCLKA3**	
		4	180	45	10	**XTPAXCLKA4**	
		5	225	45	10	**XTPAXCLKA5**	
	Each MMP with one auxiliary contact or trip-indicating auxiliary contact fitted on the right	2	99	45 + 9	10	**XTPAXCLKB2**	
		3	153	45 + 9	10	**XTPAXCLKB3**	
		4	207	45 + 9	10	**XTPAXCLKB4**	
		5	261	45 + 9	10	**XTPAXCLKB5**	
	Each MMP with an auxiliary contact and trip-indicating auxiliary contact mounted on the right or a voltage release mounted on the left.	2	108	45 + 18	10	**XTPAXCLKC2**	
		4	234	45 + 18	10	**XTPAXCLKC4**	
Frame D							
	MMP with no side mounted auxiliaries or voltage releases	2	110	55	1	**XTPAXCLKA2D**	
		3	165	55	1	**XTPAXCLKA3D**	
		4	220	55	1	**XTPAXCLKA4D**	
	Each MMP with one auxiliary contact or trip-indicating auxiliary contact fitted on the right	2	119	55 + 9	1	**XTPAXCLKB2D**	
		3	183	55 + 9	1	**XTPAXCLKB3D**	
		4	247	55 + 9	1	**XTPAXCLKB4D**	
	Each MMP with an auxiliary contact or trip-indicating auxiliary contact mounted on the right or a voltage release mounted on the left.	2	128	55 + 18	1	**XTPAXCLKC2D**	
		4	274	55 + 18	1	**XTPAXCLKC4D**	

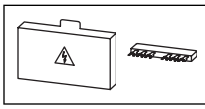
② Protected against accidental contact. B-Frame short circuit proof U_e = 690V, I_u = 63A; D-Frame short circuit proof U_e = 690V, I_u = 128A.

③ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Discount Symbol **MC7**

Shroud for Unused Terminals

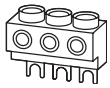
Table 185. Shroud for Unused Terminals

	For use with…	Description	Pkg. Qty.	Catalog Number	Price ①
	B-Frame XTPR	To cover unused terminals on three-phase commoning link. Protected against direct contact.	20	**XTPAXUTS**	
	D-Frame XTPR		10	**XTPAXUTSD**	

① Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Incoming Terminal ②

Table 186. Incoming Terminal

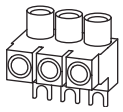
	For use with…	Pkg. Qty.	Catalog Number	Price ③
	B-Frame XTPR	5	**XTPAXIT**	

② For three-phase commoning link, protected against accidental contact, U_e = 690V, I_u = 63A; For conductor cross-sections: 2.5 – 25 mm² stranded; 2.5 – 16 mm² flexible with ferrules.

③ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Line-Side Adapter ④

Table 187. Line-Side Adapter

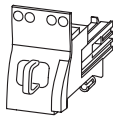
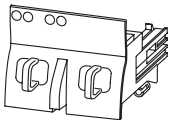
	For Use with …	Pkg. Qty.	Catalog Number	Price ⑤
	B-Frame XTPR to create a UL 508 Type E Manual Combination Starter	5	**XTPAXLSA**	
	D-Frame XTPR to create a UL 508 Type E Manual Combination Starter	1	**XTPAXLSAD**	

④ XTPAXLSA is for three-phase commoning link, finger- and back-of-hand proof, U_e = 690V, I_u = 60A for conductor cross sections: 2.5 – 25 mm² stranded, 2.5 – 16 mm² flexible with ferrule, AWG 14-6.

⑤ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Combination Connection Kits

Table 188. Combination Connection Kits

	Description	Catalog Number	Price
Non-reversing			
	Includes: Mechanical & Electrical Connection Element for XTPR…B... (MMP) and XTCE…B… (Contactor).	**XTPAXTPCB** ⑥	
	Includes: Mechanical & Electrical Connection Element for XTPR…B... (MMP) and XTCE…C… (Contactor) and DIN Rail Adapter Plate.	**XTPAXTPCC** ⑦	
	Includes: Mechanical & Electrical Connection Element for XTPR…D... (MMP) and XTCE…D… (Contactor) and DIN Rail Adapter Plate.	**XTPAXTPCD**	⑩
Reversing			
	Includes: Mechanical & Electrical Connection Element for XTPR…B... (MMP) and (2) XTCR…B… (Contactors)	**XTPAXTPCRB** ⑧	
	Includes: Mechanical & Electrical Connection Element for XTPR…B... (MMP) and (2) XTCR…C… (Contactors) and DIN Rail Adapter Plate.	**XTPAXTPCRC** ⑨	
	Includes: Mechanical & Electrical Connection Element for XTPR…D... (MMP) and (2) XTCR…D… (Contactors) and DIN Rail Adapter Plate.	**XTPAXTPCRD**	⑩

⑥ Comprised of mechanical connection element for MMP and contactor with main current wiring between MMP and contactor in the tool-less plug connection.

⑦ Comprised of a top-hat rail adapter plate and main current wiring between MMP and contactor.

⑧ Comprised of mechanical connection element for MMP and contactor with reversing combination main current wiring in the tool-less plug connection. Control cables for electrical interlocking in toolless plug connection: K1M:A1 - K2M:21, K1M:21 - K2M:A1, K1M:A2 - K2M:A2.

⑨ Comprised of a top-hat rail adapter plate and reversing combination main current wiring.

⑩ Contact Eaton.

Discount Symbol **MC7**

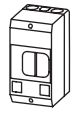
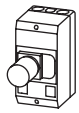
Table 189. Combination Connection Kit Mounting Plate

For Use with …	Description	Pkg. Qty.	Catalog Number ①	Price ②
XTPAXTPCB	For mounting of a B-Frame Non-reversing Manual or Combination Motor Controller	4	**XTPAXTPCPB**	
XTPAXTPCRB	For mounting of a B-Frame Reversing Manual or Combination Motor Controller	4	**XTPAXTPCRPB**	

① Comprised of 45 mm wide adapter plate and connection elements for side-by-side positioning of more plates.
② Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

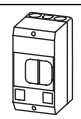
Pushbutton MMP Enclosures

Table 190. Insulated Enclosures for Surface Mounting of XTPB Pushbutton Motor-Protective Circuit Breakers — Global Usage ③

	Degree of Protection	For Use With…	Description	Catalog Number	Price
	IP40	XTPB MMP Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXSA..., XTPAXUVR..., XTPAXSR...	—	**XTPBXENCS40**	
	IP65		With actuation membrane.	**XTPBXENCS65**	
—	IP65	XTPB MMP Only or with: XTPAXFA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Lockable in OFF position.	**XTPBXENCSLO65**	
—	IP65	XTPB MMP Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXUVR..., XTPAXSR…, XTPAXCL	Lockable in OFF position in combination with XTPBXFAEM20 Early Make front mount auxiliary contact	**XTPBXENCSLE65**	
	IP65		With Emergency-Stop (E-Stop) pushbutton actuator	**XTPBXENCSES65**	
	IP65		With Emergency-Stop (E-Stop) pushbutton actuator, key release	**XTPBXENCSEK65**	

③ Integrated terminal for PE(N) connection, two M25 cable entry knockouts at top and at bottom.

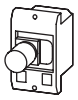
Table 191. Insulated Enclosures for Surface Mounting of XTPB Pushbutton Manual Motor Protectors — North American Usage ④

	Degree of Protection	For Use With…	Description	Catalog Number	Price
	IP41	XTPB MMP Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXSA..., XTPAXUVR..., XTPAXSR…, XTPAXCL	—	**XTPBXENAS41**	
	IP65		With actuating diaphragm	**XTPBXENAS65**	
—	IP65	XTPB MMP Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXUVR..., XTPAXSR…, XTPAXCL	Lockable in OFF position	**XTPBXENASLO65**	
—	IP65		Lockable in OFF position in combination with XTPBXFAEM20 Early Make front mount auxiliary contact.	**XTPBXENASLE65**	
	IP65		With Emergency-Stop (E-Stop) pushbutton actuator	**XTPBXENASES65**	
	IP65		With Emergency-Stop (E-Stop) pushbutton actuator, key release	**XTPBXENASEK65**	

④ Built-in terminal for PE(N).

Discount Symbol **MC7**

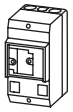
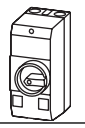
Table 192. Insulated Enclosures for Flush Mounting of XTPB Pushbutton Manual Motor Protectors — Global and North American Usage ①

	Degree of Protection	For Use With…	Description	Catalog Number	Price
	Front IP40	XTPB Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXSA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	—	**XTPBXENCF40**	
	Front IP55		With actuation membrane	**XTPBXENCF55**	
	Front IP55	XTPB Only or with: XTPAXFA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Lockable in OFF position	**XTPBXENCFLO55**	
	Front IP55	XTPB Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXUVR…, XTPAXSR…, XTPAXCL	Lockable in OFF position in combination with XTPBXFAEM20 Early Make front mount auxiliary contact	**XTPBXENCFLE55**	
	Front IP55		With Emergency-Stop (E-Stop) pushbutton actuator	**XTPBXENCFEK55**	
	Front IP55		With Emergency-Stop (E-Stop) pushbutton actuator, key release	**XTPBXENCFES55**	

① Integrated terminal for PE(N) connection.

Rotary MMP Enclosures

Table 193. Insulated Enclosures for Surface Mounting of B-Frame (0.1 – 32A) XTPR Rotary Motor-Protective Circuit Breakers — Global Usage

	Degree of Protection	For Use With…	Description	Catalog Number	Price
	IP41 with vertical mounting	B-Frame XTPR Only or with: XTPAXFA…, XTPAXSA…, XTPAXSATR…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Cover with aperture dimensioned to accommodate front of MMP. IP40, when mounted turned through 90° to left/right	**XTPAXENCS41** ②	
	IP65		With black/grey rotary handle	**XTPAXENCS65B** ②	
	IP65		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204	**XTPAXENCS65RY** ②	
	IP40	B-Frame XTPR Only or with: XTPAXSA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Cover with aperture dimensioned to accommodate front of MMP.	**XTPAXENCS40** ③	
	IP55	B-Frame XTPR Only or with: XTPAXFA…, XTPAXSA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	With black/gray rotary handle	**XTPAXENCS55B** ③	
	IP55		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204	**XTPAXENCS55RY** ③	

② M25 metric cable entry knock-out, top and bottom. Cable push-through membrane, top and bottom, in the back plate and as a control line entry. Includes N and PE terminals.

③ Integrated terminal for PE(N) connection, two M25 cable entry knockouts at the top and bottom.

Table 194. Insulated Enclosures for Surface Mounting of B-Frame (0.1 – 32A) XTPR Rotary Manual Motor Protectors — North American Usage ④

	Degree of Protection	For Use With…	Description	Catalog Number	Price
	IP55	B-Frame XTPR Only or with: XTPAXSA…and XTPAXFA…, XTPAXUVR…and XTPAXFA…, XTPAXSR…and XTPAXFA…, XTPAXCL	With black/gray rotary handle	**XTPAXENAS55B**	
	IP55		With red/yellow rotary handle for use as Emergency-Stop switch to VDE 0113	**XTPAXENAS55RY**	

④ Built-in N and PE terminal, lower part without knockouts.

Discount Symbol **MC7**

Table 195. Insulated Enclosures for Surface Mounting of B-Frame XTPR (0.1 – 32A) Rotary Motor-Protective Circuit Breakers with XTPAXFAEM20 Early-Make Front Mount Auxiliary Contact — Global Usage

	Degree of Protection	For Use With…	Description	Catalog Number	Price
	IP65	B-Frame XTPR and XTPAXFAEM20 only or with: XTPAXFA…, XTPAXSA…, XTPAXSATR…, XTPAXUVR…, XTPAXSR…, XTPAXCL	With black/gray rotary handle	**XTPAXENCSEM65B**	
	IP65		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204	**XTPAXENCSEM65RY**	
	IP55	B-Frame XTPR and XTPAXFAEM20 only or with: XTPAXFA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	With black/gray rotary handle	**XTPAXENCSEM55B**	
	IP55		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204	**XTPAXENCSEM55RY**	

Table 196. Insulated Enclosures for Surface Mounting of B-Frame XTPR (0.1 – 32A) Rotary Manual Motor Protectors with XTPAXFAEM20 Early-Make Front Mount Auxiliary Contact — North American Usage ①

	Degree of Protection	For Use With…	Description	Catalog Number	Price
	IP55	B-Frame XTPR Only or with: XTPAXSA…, XTPAXUVR…, XTPAXCL	With black/grey rotary handle	**XTPAXENASEM55B**	
	IP55		With red/yellow rotary handle for use as Emergency-Stop switch to VDE 0113	**XTPAXENASEM55RY**	

① Built-in N and PE terminal, lower part without knockouts.

Table 197. Insulated Enclosures for Surface Mounting of D-Frame (10 – 32A) Rotary Motor-Protective Circuit Breakers

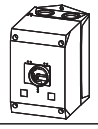
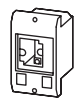
	Degree of Protection	For Use With…	Description	Catalog Number	Price
	IP65	D-Frame XTPR Only or with: XTPAXFA…, XTPAXFAEM20, XTPAXSA…, XTPAXSATR…, XTPAXUVR…, XTPAXSR…, XTPAXCL	With black/gray rotary handle	**XTPAXENCSD65B**	
	IP65		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204	**XTPAXENCSD65RY**	

Table 198. Insulated Enclosures for Flush Mounting of B-Frame (0.1-32A) XTPR Rotary Manual Motor Protectors — Global Usage ②

	Degree of Protection	For Use With…	Description	Catalog Number	Price
	Front IP40	B-Frame XTPR Only or with: XTPAXSA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Cover with aperture dimensioned to accommodate front of MMP.	**XTPAXENCF40**	
	Front IP55	B-Frame XTPR Only or with: XTPAXSA…, XTPAXUVR…, XTPAXSR…, XTPAXFA…, XTPAXCL	With black/gray rotary handle	**XTPAXENCF55B**	
	Front IP55		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204	**XTPAXENCF55RY**	

② Integrated terminal for PE(N) connection.

Discount Symbol **MC7**

MMP Enclosure Accessories

Table 199. XTPR Manual Motor Protector Enclosure Padlock Attachment

	For Use With…	Description	Catalog Number	Pkg. Qty.	Price ①
	XTPAXENCS65B, XTPAXENCS65RY, XTPAXENCSEM65B, XTPAXENCSEM65RY, XTPAXENCS55B, XTPAXENCS55RY, XTPAXENCSEM55B, XTPAXENCSEM55RY	Padlocking feature. Up to 3 padlocks with 3 – 6 mm hasp thickness. For use as main switch to IEC/EN 60204.	**XTPAXPL1** ②	3	
	XTPAXENCSD65B, XTPAXENCSD65RY		**XTPAXPL2** ②	1	
	XTPAXENCF55B, XTPAXENCF55RY		**XTPAXPL3** ③	3	

① Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.
② Lockable in the 0-position of the XTPR manual motor protector.
③ Lockable in the OFF position of the B-Frame XTPR manual motor protector.

Table 200. Neutral Terminal for use with XTPB and B-Frame XTPR Flush-Mount Enclosures

	For Use With…	Description	Catalog Number	Pkg. Qty.	Price ④
	XTPBXENCF40, XTPBXENCF55, XTPAXENCF40, XTPAXENCF55B, XTPAXENCF55RY	For connection of a fifth conductor	**XTPAXNT**	26	

④ Price listed is for a quantity of one (1). Orders must be placed in multiples of package quantity listed.

Discount Symbol **MC7**

Technical Data and Specifications

Table 201. XT Manual Motor Protectors — Technical Data and Specifications

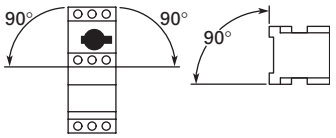
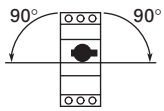
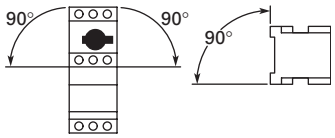
	XTPBP16B – XTPB016B	XTPRP16B – XTPR032B	XTPR016D – XTPR063D	XTPMP16B – XTPM032B	XTPTP16B – XTPT025B
General					
Standards	IEC/EN 60947, VDE 0660, UL 508, CSA C 22.2 No. 14				
Climatic proofing					
Ambient temperature, °C Storage Open Enclosed	 -25 / 80 -25 / 55 -25 / 40	 -25 / 80 -25 / 55 -25 / 40	 -25 / 70 -25 / 55 -25 / 40	 -25 / 80 -25 / 55 -25 / 40	 -25 / 80 -25 / 55 -25 / 40
Temperature compensation to IEC/EN 60947, VDE 0660, °C Operating range, °C	 -5 / 40 -25 / 55	 -5 / 40 -25 / 55	 -5 / 40 -25 / 55	 -5 / 40 -25 / 55	 -5 / 40 -25 / 55
Temperature compensation residual error for T > 20°C, %/K	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
Mounting position					
Direction of incoming supply	As required	As required	As required	As required	As required
Degree of protection Device Terminals	 IP20 IP00	 IP20 IP00	 IP20 IP00	 IP20 IP00	 IP20 IP00
Protection against direct contact	Finger- and back-of-hand proof				
Shock resistance half-sinusoidal shock 10 mS to IEC 60068-2-27 (g)	25	25	15	25	25
Altitude (m)	max. 2000	max. 2000	max. 2000	max. 2000	max. 2000
Terminal capacity Solid (mm^2) Flexible with ferrule to DIN 46228, (mm^2) Solid or stranded (AWG)	 1 x (1 – 6) 2 x (1 – 6) 1 x (1 – 6) 2 x (1 – 6) 18 – 10	 1 x (1 – 6) 2 x (1 – 6) 1 x (1 – 6) 2 x (1 – 6) 18 – 10	 1 x (1 – 50) 2 x (1 – 35) 1 x (1 – 35) 2 x (1 – 35) 14 – 2	 1 x (1 – 6) 2 x (1 – 6) 1 x (1 – 6) 2 x (1 – 6) 18 – 10	 1 x (1 – 6) 2 x (1 – 6) 1 x (1 – 6) 2 x (1 – 6) 18 – 10
Terminal screw tightening torque Main cable, Nm Main cable, lb-in Control circuit cable, Nm Control circuit cable, lb-in	 1.7 15.0 1 8.9	 1.7 15.0 1 8.9	 3 26.6 1 8.9	 1.7 15.0 1 8.9	 1.7 15.0 1 8.9
Main contacts					
Rated impulse withstand voltage (U_{imp}), V AC	6000	6000	6000	6000	6000
Overvoltage category / pollution degree	III / 3	III / 3	III / 3	III / 3	III / 3
Rated operational voltage (U_e), V AC	690	690	690	690	690
Rated uninterrupted current = rated operational current ($I_u = I_e$) in amperes	16 or current setting of the overcurrent release	32 or current setting of the overcurrent release	63 or current setting of the overcurrent release	32 or current setting of the overcurrent release	25 or current setting of the overcurrent release
Rated frequency, Hz	40 – 60	40 – 60	40 – 60	40 – 60	40 – 60
Current heat loss (3-pole at operating temperature), W	6	6	22	6	6
Lifespan, mechanical (ops)	50,000	100,000	30,000	100,000	100,000
Lifespan, electrical (AC-3 at 400 V) (ops)	50,000	100,000	30,000	100,000	100,000
Maximum operating frequency, operations/hr	25	40	40	40	40

Table 201. XT Manual Motor Protectors — Technical Data and Specifications (Continued)

	XTPBP16B – XTPB016B	XTPRP16B – XTPR032B	XTPR016D – XTPR063D	XTPMP16B – XTPM032B	XTPTP16B – XTPT025B
Main Contacts (Continued)					
Short-circuit rating AC	See **Page 137.**				
DC (kA)	60	60 (up to XTPR016B) 40 (XTPR020B – XTPR032B)	60	60 (up to XTPM016B) 40 (XTPM020B – XTPR032B)	60 (up to XTPT016B) 40 (XTPT020B – XTPT025B)
Motor switching capacity AC-3 (up to 690 V) in amperes DC-5 (up to 250 V) in amperes	 16 16	 32 25 (3 contacts in series)	 63 63 (3 contacts in series)	 32	 25
Overload release setting range (x I_u)	0.6 – 1.0	0.6 – 1.0	0.6 – 1.0	—	0.6 – 1.0
Fixed short-circuit release (x I_u)	14	14	14	14	14
Short-circuit release tolerance	± 20%	± 20%	± 20%	± 20%	± 20%
Phase-failure sensitivity	IEC/EN 60947-1-1, VDE 0660 Part 102			—	IEC/EN 60947-1-1, VDE 0660 Part 102

Table 202. Auxiliary Contacts — Technical Data and Specifications

Description	XTPAXSA_ _	XTPAXFA_ _	XTPAXCMSA_ _	XTPA(B)XFAEM_ _	XTPAXSATR_ _
Rated Impulse withstand voltage, U_{imp} (V AC)	6000	4000	6000	4000	6000
Overvoltage category/pollution degree	III/3	III/3	III/3	III/3	III/3
Rated operational voltage U_e (VAC) U_e (VDC)	 500 250	 440 250	 500 250	 440 250	 500 250
Safe isolation to VDE 0106 Part 101 and Part 101/A1 Between auxiliary contacts and main contacts (V AC)	690	690	690	690	690
Rated operational current					
AC-15 220 – 240 V, I_e (A) 380 – 415 V, I_e (A) 440 – 500 V, I_e (A)	 3.5 2 1	 1 — —	 3.5 2 1	 1 — —	 3.5 2 1
DC-13 L/R < 100 ms 24 V, I_e (A) 60 V, I_e (A) 110 V, I_e (A) 220 V, I_e (A)	 2 1.5 1 0.25	 — — — —	 2 1.5 1 0.25	 — — — —	 2 1.5 1 0.25
Lifespan					
Mechanical, operations (x 10^6)	> 0.1	> 0.1	> 5	> 0.1	> 0.01
Electrical, operations (x 10^6)	> 0.05	> 0.1	> 1	> 0.1	> 0.005
Contact reliability (@ U_e = 24V DC, U_{min} – 17V, I_{min} = 5.4 mA, fault probability (λ)	< 10^{-8} < 1 fault at 1 x 10^8 operations				
Positively driven contacts to ZH 1/457	Yes	–	Yes	–	–
Short-circuit rating without welding					
Fuseless	FAZ-B4/1-HI	–	FAZ-B4/1-HI	–	FAZ-B4/1-HI
Fuse (A gG/gL)	10	10	10	10	10
Terminal Capacity					
Solid or flexible conductor with ferrule (mm^2)	0.75 –2.5	0.75 – 1.5	0.75 – 2.5	0.75 – 1.5	0.75 – 2.5
Solid or stranded (AWG)	18 – 14	18 – 16	18 – 14	18 – 16	18 – 14

Table 203. Undervoltage Release — Technical Data and Specifications

Description	XTPAXUVR...
Cross-sections	
Solid or flexible conductor with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or stranded (AWG)	1 x (18 – 14) 2 x (18 – 14)
Main Contacts	
Rated operational voltage, U_e (V AC)	42 – 480
Rated operational voltage, U_e (V DC)	24 – 250
Pick-up voltage, x U_s	0.85 – 1.1
Drop-out voltage, x U_s	0.7 – 0.35
Power Consumption	
Pick-up AC (VA)	5
Sealing AC (VA)	3

Table 204. Current Limiter

Description	XTPAXCL
Rated Impulse withstand Voltage (U_{imp}), V AC	6000
Overvoltage Category/ Pollution Degree	III/3
Rated operational voltage, U_e (V AC)	690
Rated interrupted current = Rated operational current ($I_u = I_e$) in amperes	63

Table 205. Shunt Release — Technical Data and Specifications

Description	XTPAXSR __
Cross-sections	
Solid or flexible conductor with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or stranded (AWG)	1 x (18 – 14) 2 x (18 – 14)
Main Contacts	
Rated operational voltage, U_e (V AC)	42 – 480
Rated operational voltage, U_e (V DC)	24 – 250
AC Operating Range, x U_s	0.7 – 1.1
DC Operating Range, x U_s (intermittent operation 5s)	0.7 – 1.1
Power Consumption	
Pick-up AC (VA)	5
Sealing AC (VA)	3
Pick-up DC (VA)	3
Sealing DC (VA)	3

Time/Current Curve

Characteristics

The time/current characteristic, the current limiting characteristics and the I^2t characteristics were determined in accordance with DIN VDE 0660 and IEC 60 947.

The tripping characteristic of the **inverse-time delayed overload releases** (thermal overload releases or "a" releases) for DC and AC with a frequency of 0 to 400 Hz also apply to the time/current characteristic.

The characteristics apply to the cold state. At operating temperature, the tripping times of the thermal releases are reduced to approximately 25%.

Under normal operating conditions, all three poles of the device must be loaded. The three main conducting paths must be connected in series in order to protect single-phase or DC loads.

With 3-pole loading, the maximum deviation in the tripping time for 3 times the setting current and upwards is ±20% and thus in accordance with DIN VDE 0165.

The tripping characteristics for the instantaneous, electromagnetic overcurrent releases (short-circuit releases or "n" releases) are based on the rated current I_n, which is also the maximum value of the setting range for circuit-breakers with adjustable overload releases. If the current is set to a lower value, the tripping current of the "n" release is increased by a corresponding factor.

The characteristics of the electromagnetic overcurrent releases apply to frequencies of 50/60 Hz. Appropriate correction factors must be used for lower frequencies up to 16-2/3 Hz, for higher frequencies up to 400 Hz and for DC.

Time/current characteristics, current limiting characteristics and I^2t characteristics are available on request.

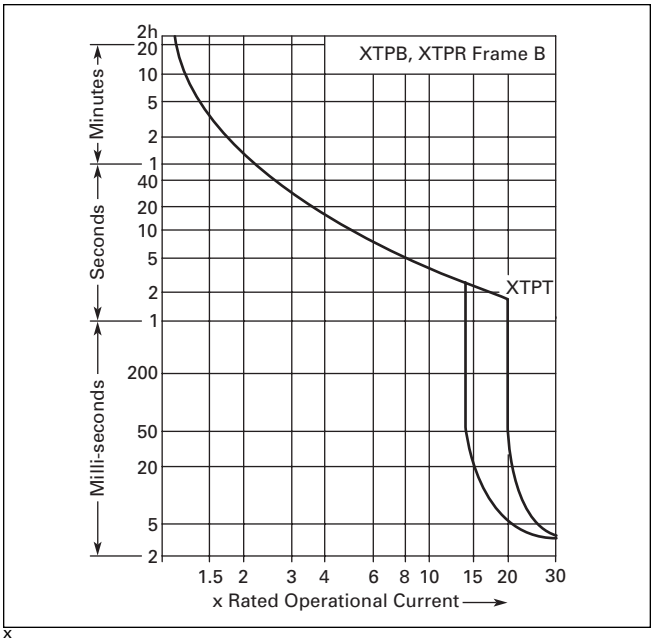


Figure 76. MMP Tripping Characteristics — XTPB, XTPR Frame B and XTPT (not for XTPM)

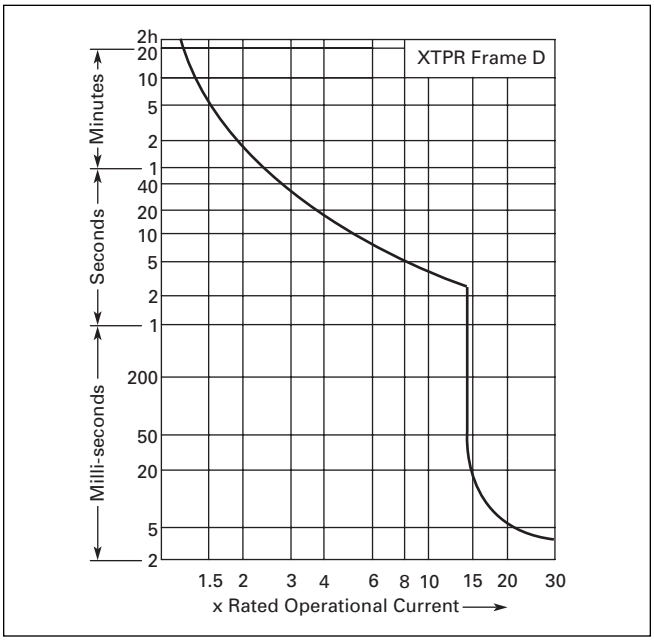


Figure 77. MMP Tripping Characteristics — XTPR Frame D

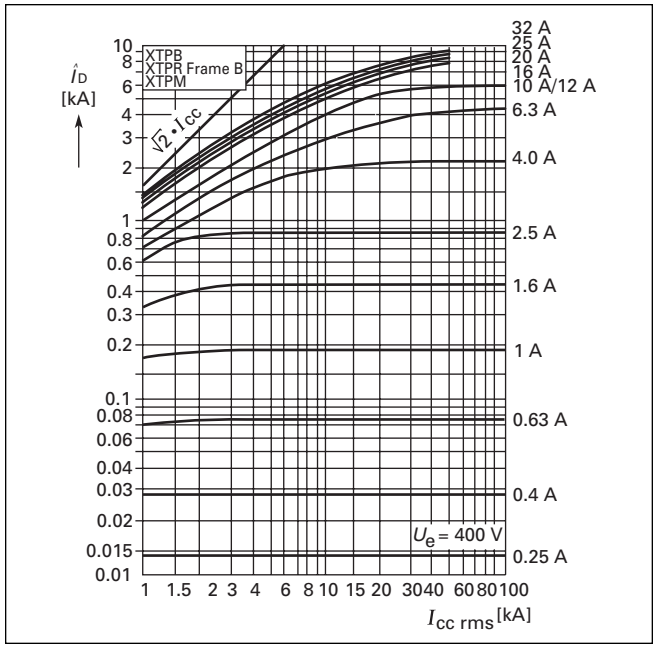


Figure 78. MMP Let-Through Tripping Characteristics — XTPB, XTPR Frame B, XTPT

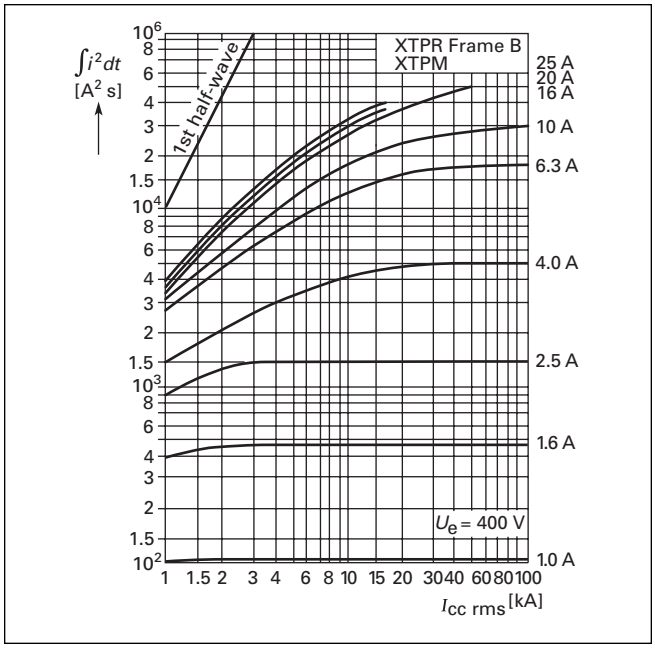


Figure 80. MMP Let-Through Tripping Characteristics — XTPR Frame B, XTPM

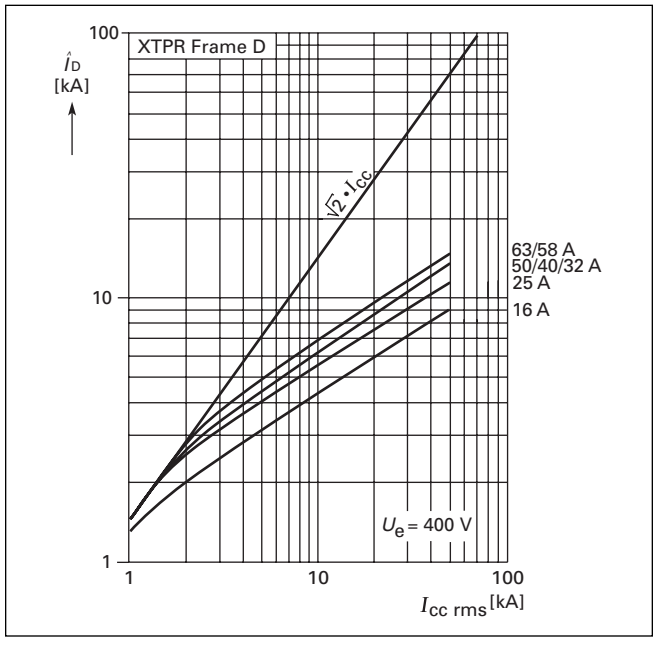


Figure 79. MMP Let-Through Tripping Characteristics — XTPR Frame D

Manual Motor Protector Short Circuit Ratings

Rated uninterrupted current I_u = Rated operational current I_e.
Rated conditional short circuit current I_q — IEC/EN 60947-4-1.
Rated ultimate short circuit breaking capacity I_{cu} — IEC/EN 60947-2.
Rated operational short circuit breaking capacity I_{cs} — IEC/EN 60947-2.

Table 206. Manual Motor Protector Short Circuit Ratings

I_u	230V				400V				440V				500V				690V			
	I_q	I_{cu}	I_{cs}	Fuse ②③	I_q	I_{cu}	I_{cs}	Fuse ②③	I_q	I_{cu}	I_{cs}	Fuse ②③	I_q	I_{cu}	I_{cs}	Fuse ②③	I_q	I_{cu}	I_{cs}	Fuse ②③
A	kA	kA	kA	A	kA	kA	kA	A	kA	kA	kA	A	kA	kA	kA	A	kA	kA	kA	A
XTPB with classification Type "1" and Type "2"																				
0.16 – 1	50	50	50	50	50	50	50	50	50	50	50	50								
1.6	50	50	50	50	50	50	50	50	50	50	50	50								
2.5	50	50	50	50	50	50	50	50	50	50	50	50								
4	50	50	50	50	50	50	50	50	50	50	50	50								
6.3	50	50	50	50	50	50	50	50	50	50	50	50								
10	50	50	50	50	50	50	50	50	42	42	10	50								
12	50	50	50	50	50	50	10	50	15	15	10	50								
16																				
20																				
25																				
XTPR…BC1, XTPT, XTPM with classification Type "1" and Type "2"																				
0.16 – 1	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	①	①	①	50	①	①	①	N	①	①	①	N
1.6	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	①	①	①	50	①	①	①	N	①	①	①	N
2.5	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	①	①	①	50	①	①	①	N	5	5	5	50
4	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	①	①	①	50	①	①	①	N	3	3	3	50
6.3	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	①	①	①	50	42	42	6	50	3	3	2	50
10	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	42	42	10	50	42	42	6	50	3	3	2	50
12	50	50	10	50	50	50	10	50	15	15	10	50	15	15	6	50	3	3	2	50
16	50	50	10	50	50	50	10	50	15	15	10	50	15	15	6	50	3	3	2	50
20	50	50	10	50	50	50	10	50	15	15	10	50	6	6	6	50	3	3	2	50
25	50	50	10	50	50	50	10	50	10	10	10	50	6	6	6	50	3	3	2	50
32	50	50	10	50	50	50	10	50	10	10	10	50	6	6	6	50	3	3	2	50
XTPR…DC1 with classification Type "1" and Type "2"																				
16	150 ①	150 ①	25	N	150 ①	150 ①	25	N	45	45	25	100	15	15		100	8	8	2.5	100
25	150 ①	150 ①	25	N	150 ①	150 ①	25	N	45	45	25	100	15	15		100	8	8	2.5	100
32	50	50	25	100	50	50	25	100	45	45	25	100	15	15		100	5	5	2.5	100
40	50	50	25	100	50	50	25	100	45	45	25	100	15	15		100	5	5	2.5	100
50	50	50	25	100	50	50	25	100	45	45	25	100	15	15		100	5	5	2.5	100
58	50	50	25	160	50	50	25	160	45	45	25	160	15	15		160	5	5	2.5	160
63	50	50	25	160	50	50	25	160	45	45	25	160	15	15		160	5	5	2.5	160
XTPR…BC1, XTPT, XTPM with Current Limiter XTPAXCL																				
0.16 – 1	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N
1.6	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N
2.5	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	20	20	20	N
4	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	20	20	20	N
6.3	①	①	①	N	①	①	①	N	①	①	①	N	①	①	50	N	20	20	20	N
10	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N	20	20	20	N
12	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N	5	5	2.5	N
16	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N	5	5	2.5	N
20	①	①	①	N	①	①	①	N	①	①	①	N	10	10	10	N	5	5	2.5	N
25	①	①	①	N	①	①	①	N	①	①	①	N	10	10	10	N	5	5	2.5	N
32	①	①	①	N	①	①	①	N	①	①	①	N	10	10	10	N	5	5	2.5	N
XTPR…BC1, XTPT, XTPM with (2) Current Limiters XTPAXCL																				
0.16 – 1	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N
1.6	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N
2.5	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	40	40	20	N
4	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	40	40	20	N
6.3	①	①	①	N	①	①	①	N	①	①	①	N	①	①	50	N	20	20	20	N
10	①	①	①	N	①	①	①	N	①	①	①	N	①	①	40	N	20	20	20	N
12	①	①	①	N	①	①	①	N	①	①	①	N	①	①	40	N	10	10	2.5	N
16	①	①	①	N	①	①	①	N	①	①	①	N	①	①	40	N	10	10	2.5	N
20	①	①	①	N	①	①	①	N	①	①	①	N	20	20	20	N	10	10	2.5	N
25	①	①	①	N	①	①	①	N	①	①	①	N	20	20	20	N	10	10	2.5	N
32	①	①	①	N	①	①	①	N	①	①	①	N	20	20	20	N	10	10	2.5	N

① No upstream protective device required, as it is the auto-protected range (100/150 kA — Frame B, 150 kA — Frame D).
② N = Not required.
③ XTPR…BC1, XTPT, XTPM — Required back-up fuse if the short circuit current exceeds the rated conditional short circuit current ($I_{cc} > I_q$);
XTPB, XTPR...DC1 — Fuse (A gG/gL) for enhancing the switching capacity of the motor protective circuit breaker to 100 kA.

Table 207. Ratings for Group Motor Applications — UL 508 / CSA C22.2 No. 14

Catalog Number	Rated Uninterrupted Current — I_u (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Protective Device for UL/CSA Group Protection					
				Max. RMS Sym Current — 600V (kA)		Maximum Fuse Rating (A)		Circuit Breaker Max (A)	
					w/Current Limiter — XTPAXCL		w/Current Limiter — XTPAXCL		w/Current Limiter — XTPAXCL
XTPB — Frame B, Manual Motor Protector with Thermal and Magnetic Trip									
XTPBP16BC1	0.16	0.1 – 0.16	2.2	50	—	600	—	600	—
XTPBP25BC1	0.25	0.16 – 0.25	3.5	50	—	600	—	600	—
XTPBP40BC1	0.4	0.25 – 0.4	5.6	50	—	600	—	600	—
XTPBP63BC1	0.63	0.4 – 0.63	8.8	50	—	600	—	600	—
XTPB001BC1	1	0.63 – 1	14	50	—	600	—	600	—
XTPB1P6BC1	1.6	1 – 1.6	22	50	—	600	—	600	—
XTPB2P5BC1	2.5	1.6 – 2.5	35	50	—	600	—	600	—
XTPB004BC1	4	2.5 – 4	56	50	—	600	—	600	—
XTPB6P3BC1	6.3	4 – 6.3	88	50	—	600	—	600	—
XTPB010BC1	10	6.3 – 10	140	10	50	150	600	125 ②	600
XTPB012BC1	12	8 – 12	168	10	50	150	600	125 ②	600
XTPB016BC1	16	10 – 16	224	10 ①	50 ①	150 ①	600 ①	125 ①②	600 ①
XTPB020BC1 ③	20	16 – 20	280	10 ①	18 ①	150 ①	600 ①	125 ①	600 ①
XTPB025BC1 ③	25	20 – 25	350	10 ①	18 ①	150 ①	600 ①	125 ①	600 ①
XTPR — Frame B (all Screw and Spring Cage terminal options), Manual Motor Protector with Thermal and Magnetic Trip									
XTPRP16BC1	0.16	0.1 – 0.16	2.2	50	—	600	—	600	—
XTPRP25BC1	0.25	0.16 – 0.25	3.5	50	—	600	—	600	—
XTPRP40BC1	0.4	0.25 – 0.4	5.6	50	—	600	—	600	—
XTPRP63BC1	0.63	0.4 – 0.63	8.8	50	—	600	—	600	—
XTPR001BC1	1	0.63 – 1	14	50	—	600	—	600	—
XTPR1P6BC1	1.6	1 – 1.6	22	50	—	600	—	600	—
XTPR2P5BC1	2.5	1.6 – 2.5	35	50	—	600	—	600	—
XTPR004BC1	4	2.5 – 4	56	50	—	600	—	600	—
XTPR6P3BC1	6.3	4 – 6.3	88	50	—	600	—	600	—
XTPR010BC1	10	6.3 – 10	140	10	50	150	600	125 ②	600
XTPR012BC1	12	8 – 12	168	10	50	150	600	125	600
XTPR016BC1	16	10 – 16	224	10	50	150	600	125 ②	600
XTPR020BC1	20	16 – 20	280	10	18	150	600	125	600
XTPR025BC1	25	20 – 25	350	10	18	150	600	125	600
XTPR032BC1	32	25 – 32	448	10	18	150	600	125	600
XTPR — Frame D, Manual Motor Protector with Thermal and Magnetic Trip									
XTPR016DC1	16	10 – 16	224	10	—	600	—	600	—
XTPR025DC1	25	16 – 25	350	10	—	600	—	600	—
XTPR032DC1	32	25 – 32	448	10	—	600	—	600	—
XTPR040DC1	40	32 – 40	560	10	—	600	—	600	—
XTPR050DC1	50	40 – 50	700	10 ①	—	600 ①	—	600 ①	—
XTPR058DC1	58	50 – 58	812	10 ①	—	600 ①	—	600 ①	—
XTPR063DC1	65	55 – 63	882	10 ①	—	600 ①	—	600 ①	—
XTPT — Frame D, Manual Motor Protector with Thermal and Magnetic Trip									
XTPTP16BC1	0.16	0.1 – 0.16	2.4	50	—	600	—	600	—
XTPTP25BC1	0.25	0.16 – 0.25	4.25	50	—	600	—	600	—
XTPTP40BC1	0.4	0.25 – 0.4	6.8	50	—	600	—	600	—
XTPTP63BC1	0.63	0.4 – 0.63	12	50	—	600	—	600	—
XTPT001BC1	1	0.63 – 1	20	50	—	600	—	600	—
XTPT1P6BC1	1.6	1 – 1.6	32	50	—	600	—	600	—
XTPT2P5BC1	2.5	1.6 – 2.5	50	50	—	600	—	600	—
XTPT004BC1	4	2.5 – 4	84	50	—	600	—	600	—
XTPT6P3BC1	6.3	4 – 6.3	141	50	—	600	—	600	—
XTPT010BC1	10	6.3 – 10	224	10	50	150	600	125 ②	600
XTPT012BC1	12	8 – 12	224	10	50	150	600	125	600
XTPT016BC1	16	10 – 16	358	10	50	150	600	125	600
XTPT020BC1	20	16 – 20	380	10	18	150	600	125	600
XTPT025BC1	25	20 – 25	420	10	18	150	600	125	600

① Rating is pending UL approval, available September 2005. Contact Eaton for availability.
② 22kA 600V AC
③ IEC/EN 60947-4-1

Table 208. Ratings for Manual Motor Controllers (MMC) and Combination Motor Controllers (CMC)

Catalog Number		Rated Current — I_e (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Rated Short Circuit Breaking Capacity (kA)		
Non-reversing	Reversing				240V	480/277V	600/347V
XTSC & XTSR Manual Motor Controllers (MMC) / Starter Combinations							
XTSCP25BB_	XTSRP25BB_	0.25	0.16 – 0.25	3.5	50	50	50
XTSCP40BB_	XTSRP40BB_	0.4	0.25 – 0.4	5.6	50	50	50
XTSCP63BB_	XTSRP63BB_	0.63	0.4 – 0.63	8.82	50	50	50
XTSC001BB_	XTSR001BB_	1	0.63 – 1	14	50	50	50
XTSC1P6BB_	XTSR1P6BB_	1.6	1 – 1.6	22.4	50	50	50
XTSC2P5BB_	XTSR2P5BB_	2.5	1.6 – 2.5	35	50	50	50
XTSC004BB_	XTSR004BB_	4	2.5 – 4	56	50	50	50
XTSC6P3BB_	XTSR6P3BB_	6.3	4 – 6.3	88.2	50	50	50
XTSC010BB_	XTSR010BB_	10	6.3 – 10	140	50	50	50
XTSC012BB_	XTSR012BB_	12	8 – 12	168	50	42	—
XTSC016BC_	XTSR016BC_	16	10 – 16	224	18	42	—
XTSC020BC_	XTSR020BC_	20	16 - 20	280	18	18	—
XTSC025BC_	XTSR025BC_	25	20 – 25	350	18	18	—
XTSC032BC_	XTSR032BC_	32	25 – 32	448	18	18	—
XTSC016DC_	XTSR016DC_	16	10 – 16	224	50	50	—
XTSC025DC_	XTSR025DC_	25	16 – 25	350	50	50	—
XTSC032DC_	XTSR032DC_	32	25 – 32	448	50	50	—
XTSC040DD_	XTSR040DD_	40	32 – 40	560	50	50	—
XTSC050DD_	XTSR050DD_	50	40 – 50	700	50 ①	50 ①	—
XTSC058DD_	XTSR058DD_	58	50 – 58	812	50 ①	50 ①	—
XTSC063DD_	XTSR063DD_	63	55 – 63	882	50 ①	50 ①	—
XTFC & XTFR Combination Motor Controllers (CMC), UL 508 Type F							
XTFCP25BB_	XTFRP25BB_	0.25	0.16 – 0.25	3.5	50	50	50
XTFCP40BB_	XTFRP40BB_	0.4	0.25 – 0.4	5.6	50	50	50
XTFCP63BB_	XTFRP63BB_	0.63	0.4 – 0.63	8.82	50	50	50
XTFC001BB_	XTFR001BB_	1	0.63 – 1	14	50	50	50
XTFC1P6BB_	XTFR1P6BB_	1.6	1 – 1.6	22.4	50	50	50
XTFC2P5BB_	XTFR2P5BB_	2.5	1.6 – 2.5	35	50	50	50
XTFC004BB_	XTFR004BB_	4	2.5 – 4	56	50	50	50
XTFC6P3BB_	XTFR6P3BB_	6.3	4 – 6.3	88.2	50	50	50
XTFC010BB_	XTFR010BB_	10	6.3 – 10	140	50	50	50
XTFC012BB_	XTFR012BB_	12	8 – 12	168	50	42	—
XTFC016BC_	XTFR016BC_	16	10 – 16	224	18	18	—
XTFC020BC_	XTFR020BC_	20	16 - 20	280	18	18	—
XTFC025BC_	XTFR025BC_	25	20 – 25	350	18	18	—
XTFC032BC_	XTFR032BC_	32	25 – 32	448	18	18	—
XTFC016DC_	XTFR016DC_	16	10 – 16	224	50	50	—
XTFC025DC_	XTFR025DC_	25	16 – 25	350	50	50	—
XTFC032DC_	XTFR032DC_	32	25 – 32	448	50	50	—
XTFC040DD_	XTFR040DD_	40	32 – 40	560	50	50	—

① Ratings pending UL approval. Contact Eaton for availability.

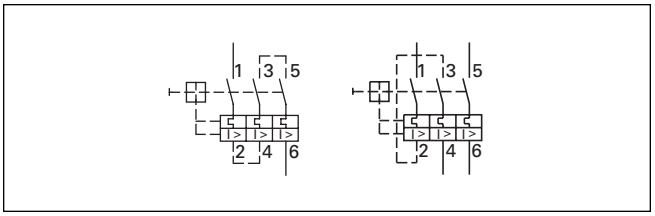


Figure 81. XTPB, XTPR 1- and 2-Pole Circuits with DC and AC Current

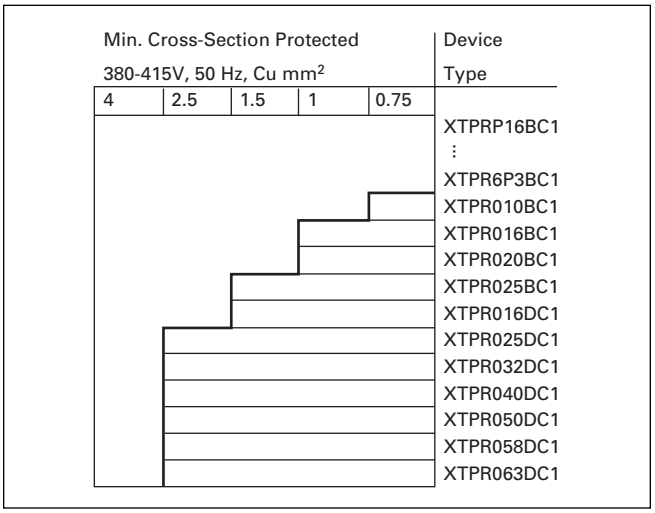


Figure 82. Protection of PVC Insulated Cables Against Thermal Overload at Short Circuit

The table indicates which minimum cable cross-sections are protected by XTPR motor protective circuit breakers up to their rated conditional short circuit current I_q.

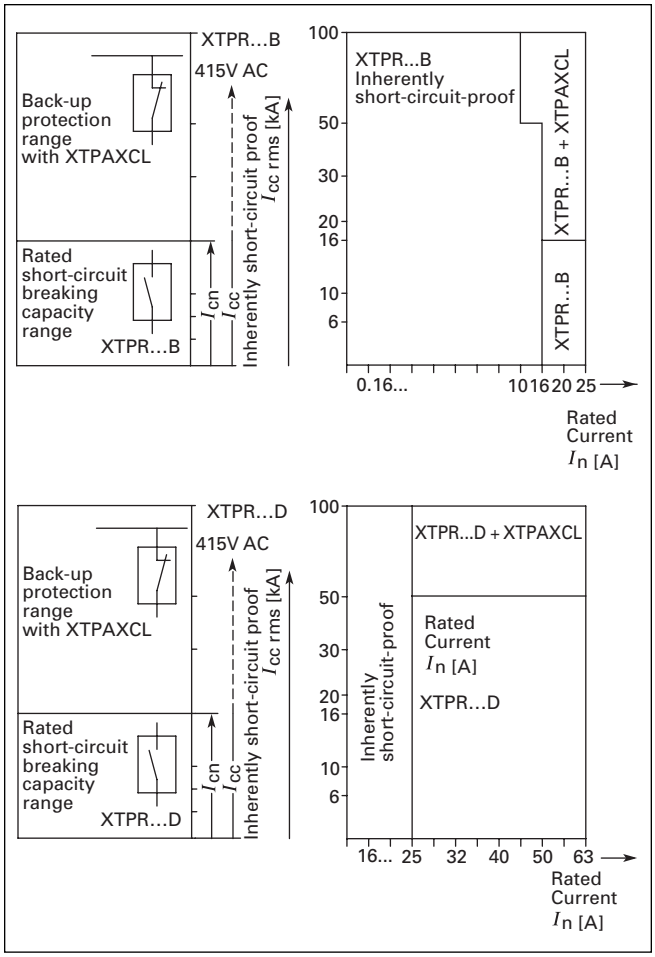


Figure 83. Fuseless Installation with XTPR, Back-Up Protection Diagrams

Dimensions

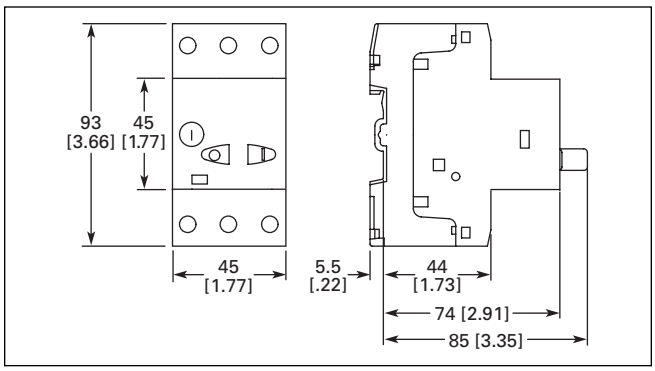


Figure 84. Manual Motor Protectors — XTPB (Approximate Dimensions in mm [in])

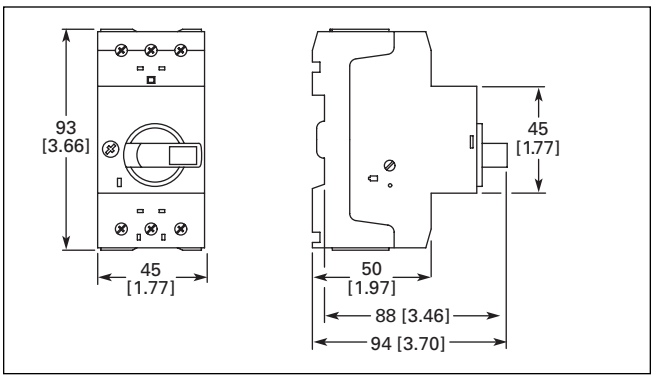


Figure 85. Manual Motor Protectors, Manual Transformer Protectors — XTPR…B, XTPT and XTPM (Approximate Dimensions in mm [in])

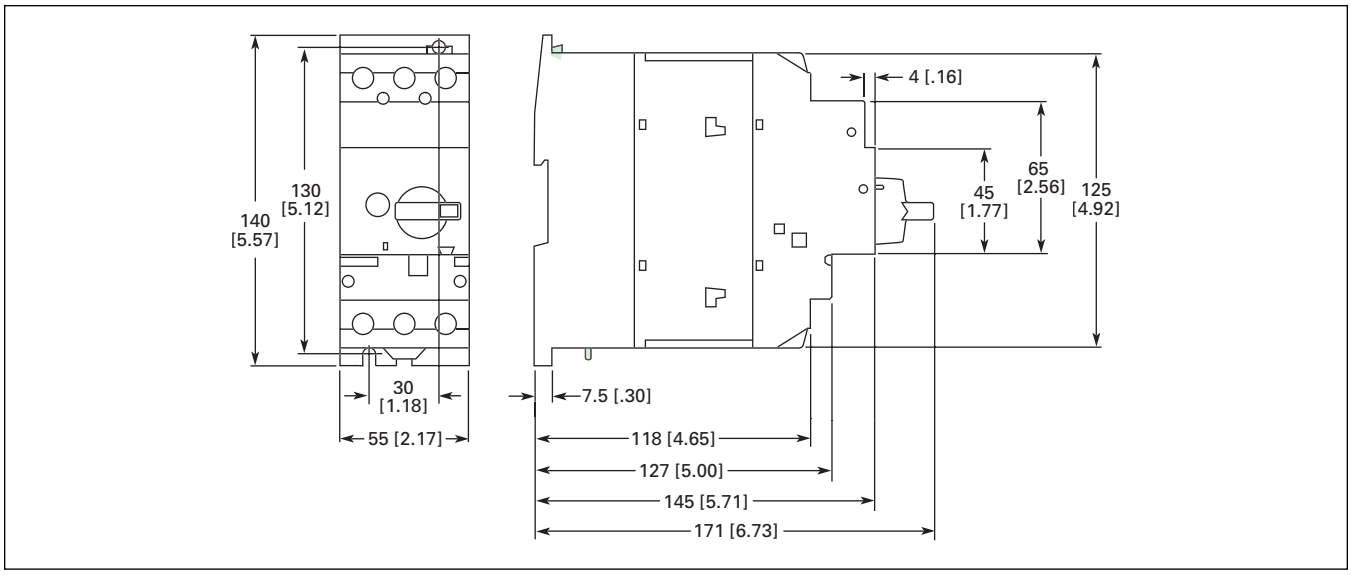


Figure 86. Manual Motor Protector — XTPR…DC1 (Approximate Dimensions in mm [in])

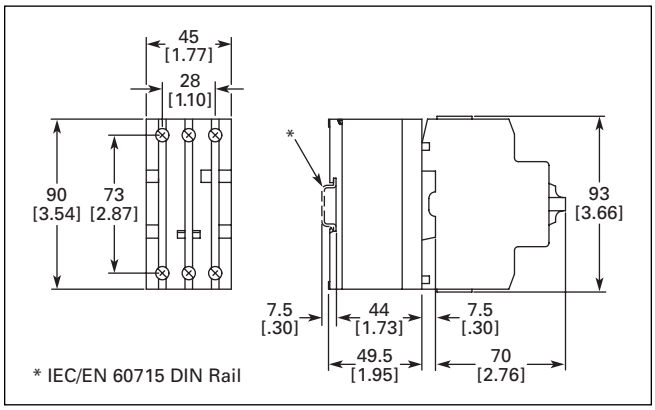


Figure 87. Current Limiter — XTPAXCL (Approximate Dimensions in mm [in])

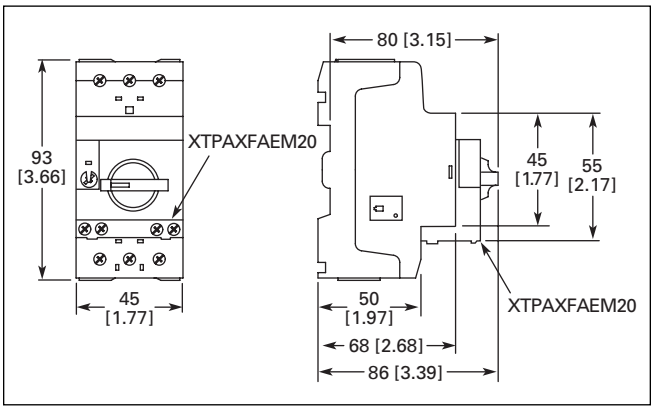


Figure 88. MMPs with Early-Make Auxiliary Contacts — XTPR…BC1 + XTPAXFAEM20 (Approximate Dimensions in mm [in])

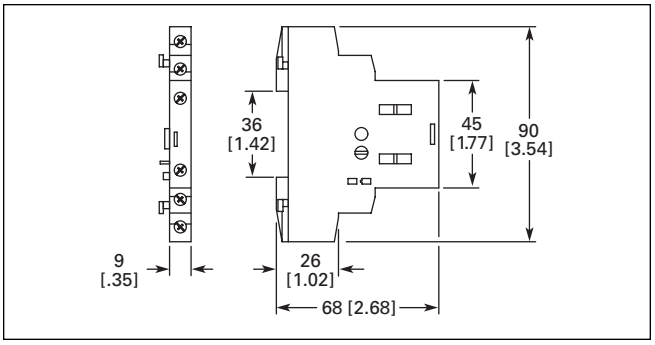


Figure 89. Standard Auxiliary Contact — XTPAXSA… (Approximate Dimensions in mm [in])

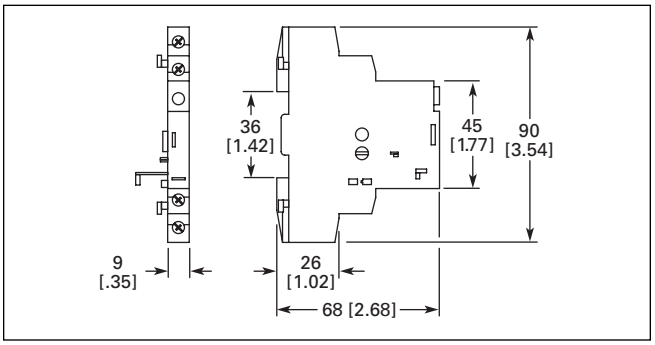


Figure 90. Trip Indicating Auxiliary Contact — XTPAXSATR… (Approximate Dimensions in mm [in])

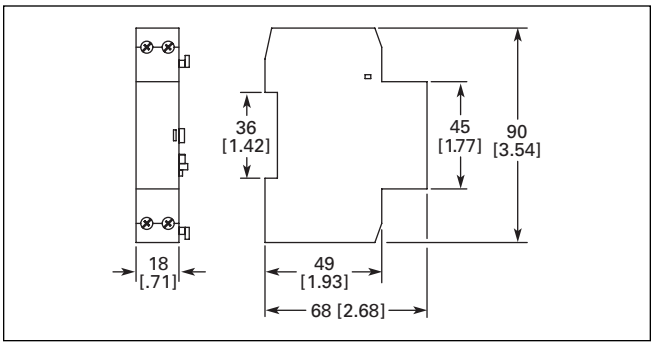


Figure 91. Undervoltage / Shunt Release — XTPAXUVR…, XTPAXSR… (Approximate Dimensions in mm [in])

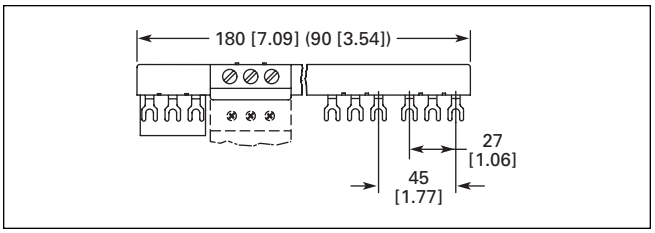


Figure 92. Three-Phase Commoning Link — XTPAXCLKA4, XTPAXCLKA2 (Approximate Dimensions in mm [in])

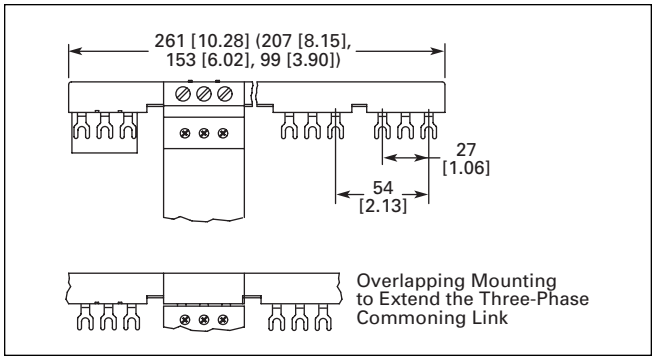


Figure 93. Three-Phase Commoning Link — XTPAXCLKB5, XTPAXCLKB4, XTPAXCLKB3, and XTPAXCLKB2 (Approximate Dimensions in mm [in])

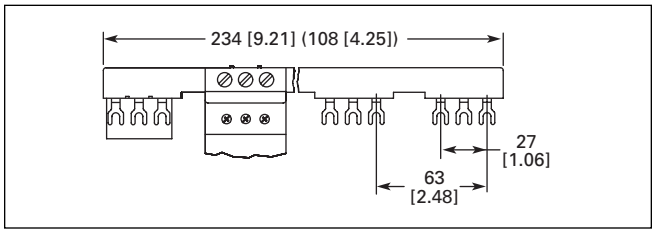


Figure 94. Three-Phase Commoning Link — XTPAXCLKC4, XTPAXCLKC2 (Approximate Dimensions in mm [in])

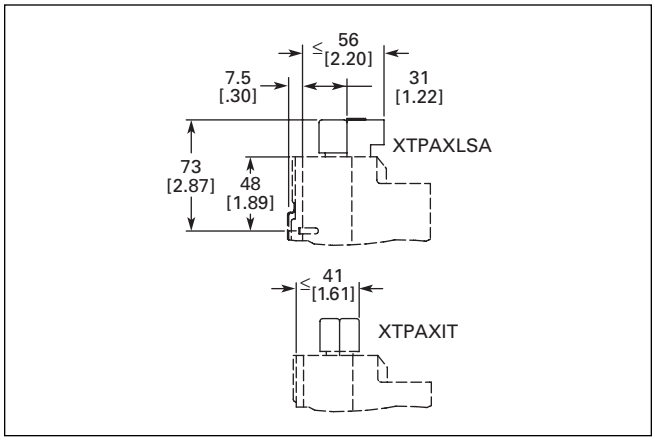


Figure 95. Incoming Terminal, Line Side Adapter — XTPAXIT, XTPAXLSA (Approximate Dimensions in mm [in])

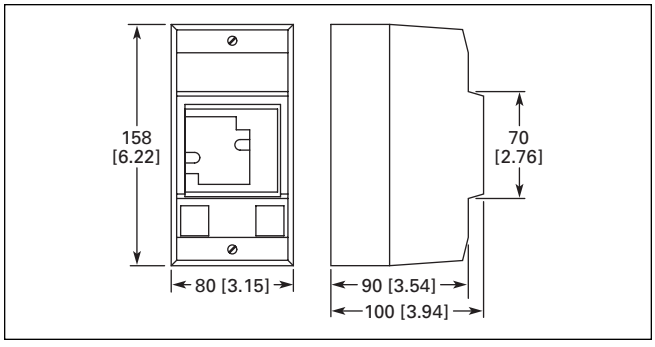


Figure 96. Insulated Enclosures for Surface Mounting — XTPAXENCS40 (Approximate Dimensions in mm [in])

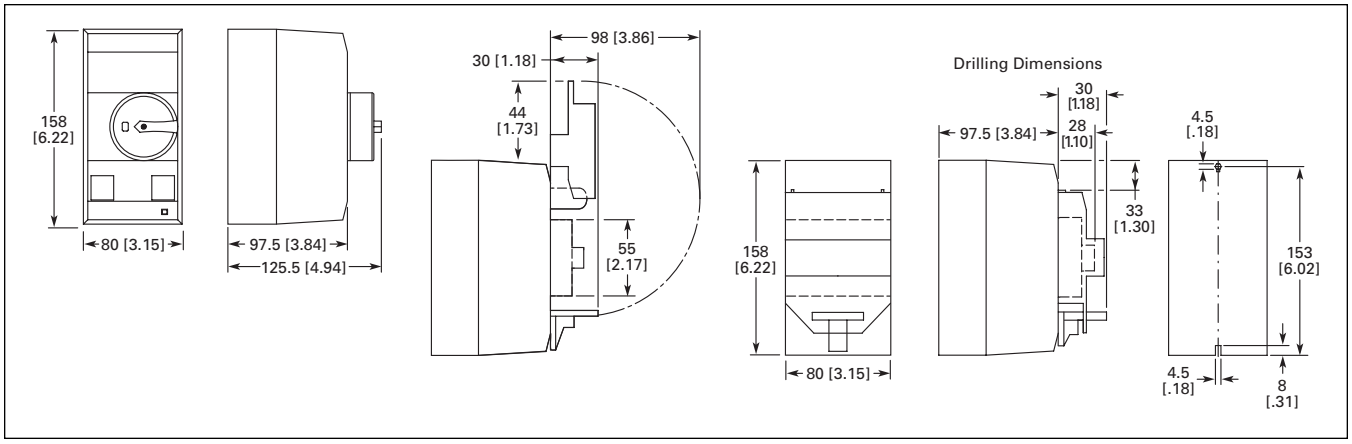


Figure 97. Insulated Enclosures for Surface Mounting — XTPAXENCS55…, XTPAXENCSEM… (Approximate Dimensions in mm [in])

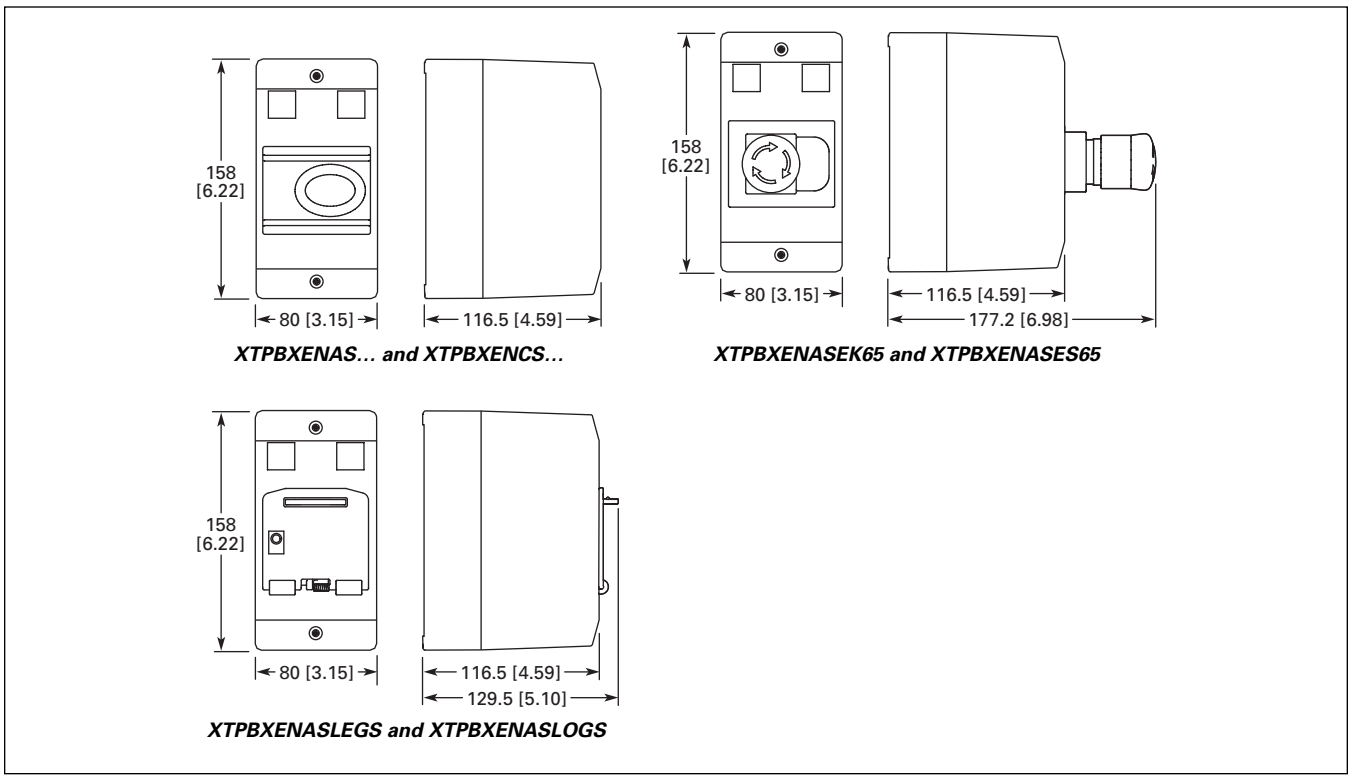


Figure 98. Insulated Enclosures for Surface Mounting — (Approximate Dimensions in mm [in])

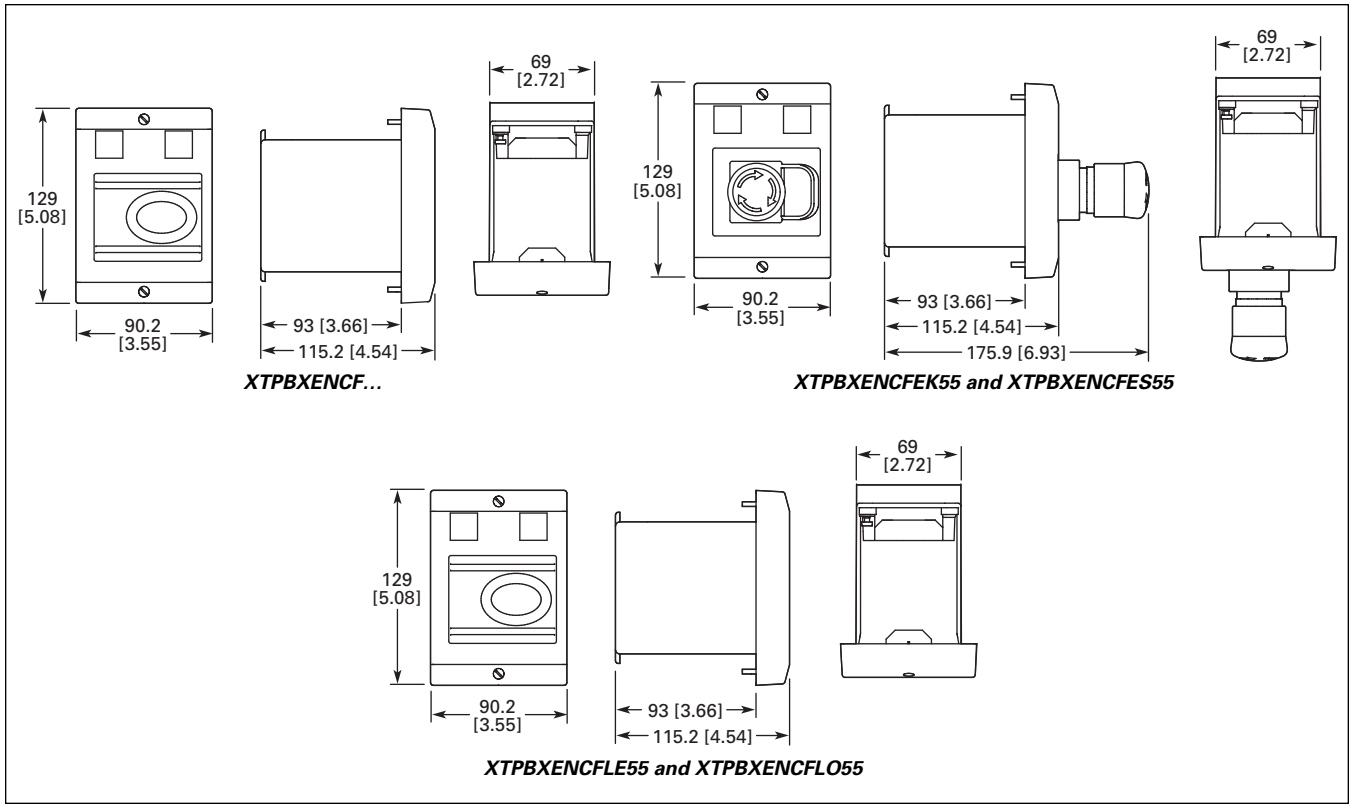


Figure 99. Insulated Enclosures for Flush Mounting — (Approximate Dimensions in mm [in])

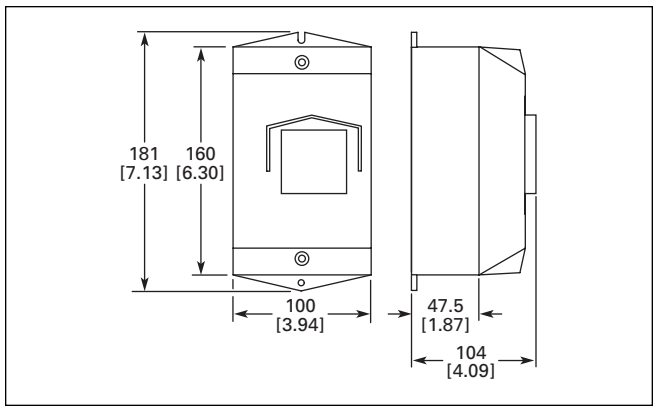


Figure 100. Insulated Enclosures for Surface Mounting — XTPAXENAS41 and XTPAXENCS41 (Approximate Dimensions in mm [in])

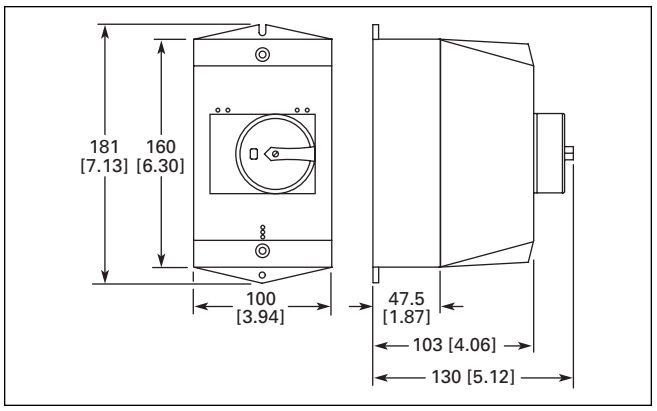


Figure 101. Insulated Enclosures for Surface Mounting — XTPAXENAS55..., XTPAXENASEM55..., XTPAXENCS65..., XTPAXENCSEM65... (Approximate Dimensions in mm [in])

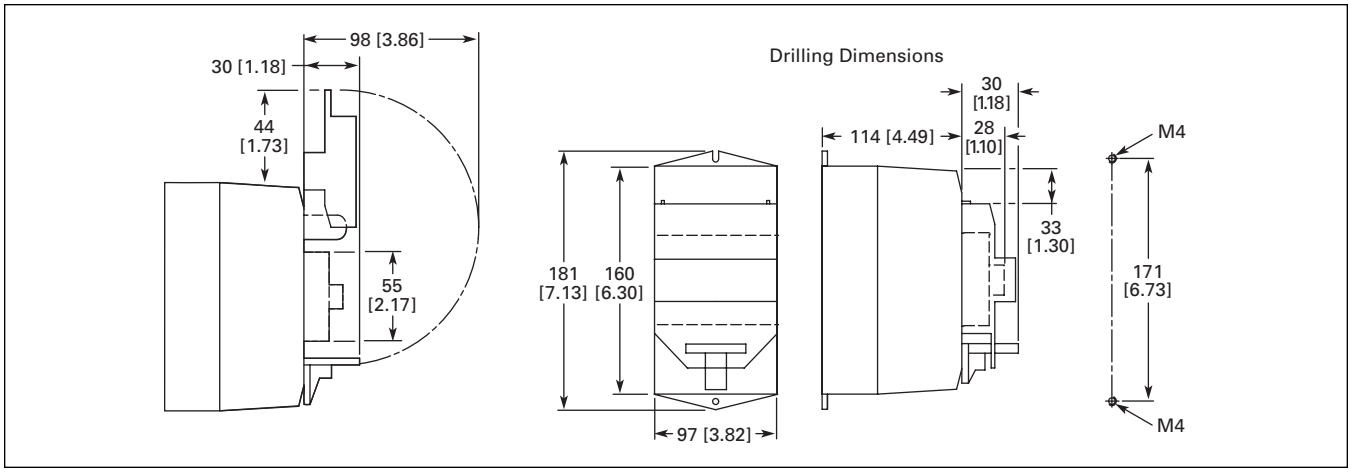


Figure 102. Drilling Dimensions —XTPAXENAS55…, XTPAXENASEM55…, XTPAXENCS65…, XTPAXENCSEM65… + XTPAXPL1 (Approximate Dimensions in mm [in])

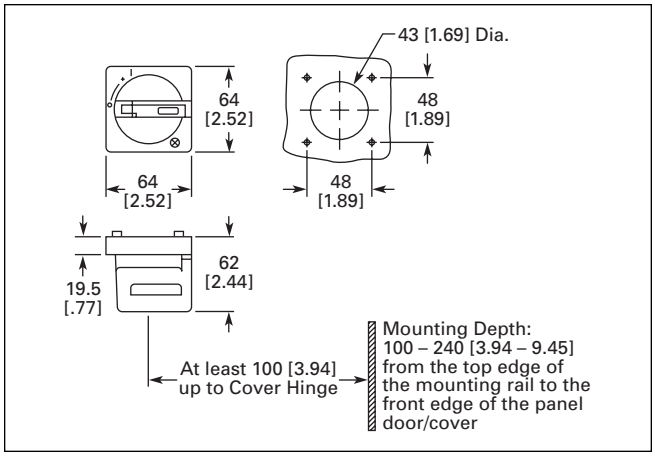


Figure 103. Rotary Handle Mechanism — XTPAXRHM… (Approximate Dimensions in mm [in])

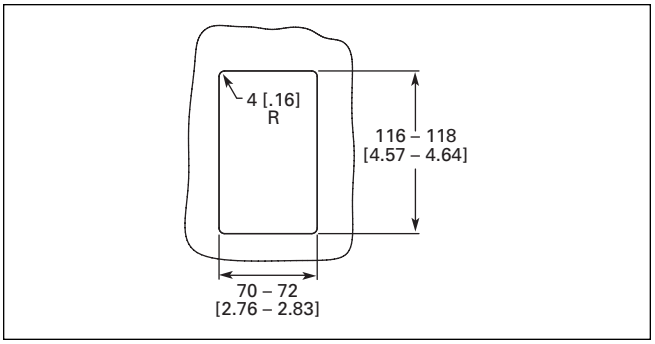


Figure 104. Mounting Cutout — XTPAXENCF… (Approximate Dimensions in mm [in])

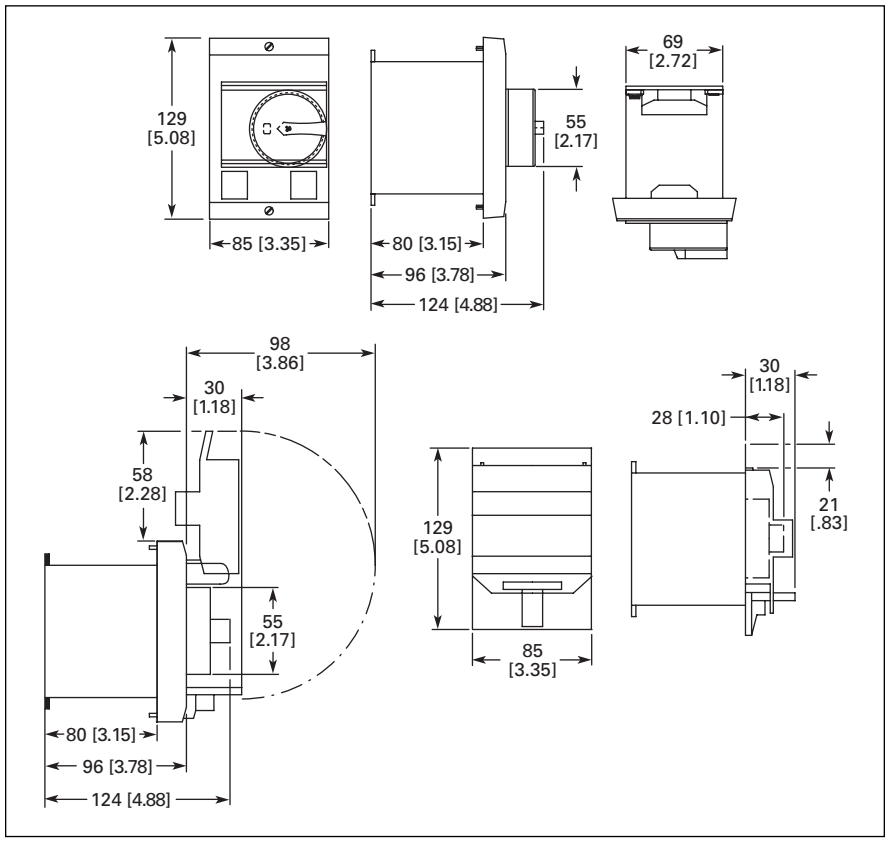


Figure 105. Insulated Enclosures for Flush Mounting — XTPAXENCF…, XTPAXENCF55… + XTPAXPL3 (Approximate Dimensions in mm [in])

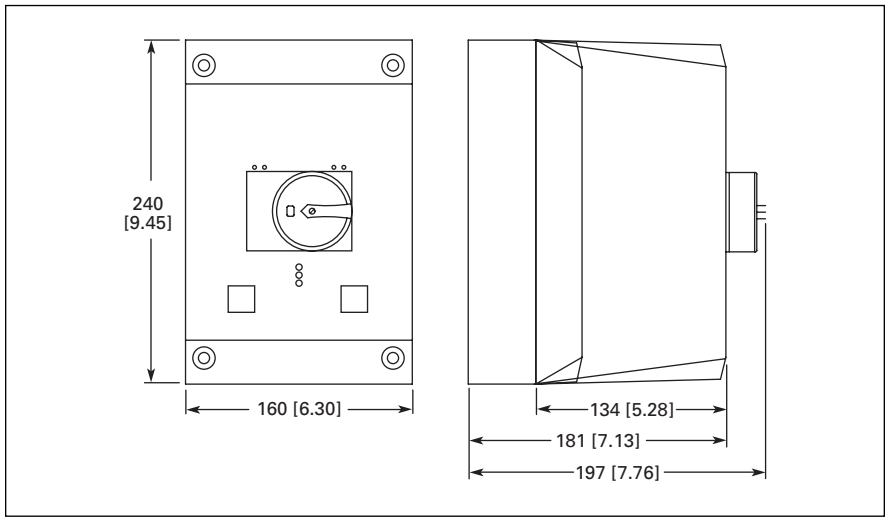


Figure 106. Insulated Enclosures for Surface Mounting — XTPAXENCSD65… (Approximate Dimensions in mm [in])

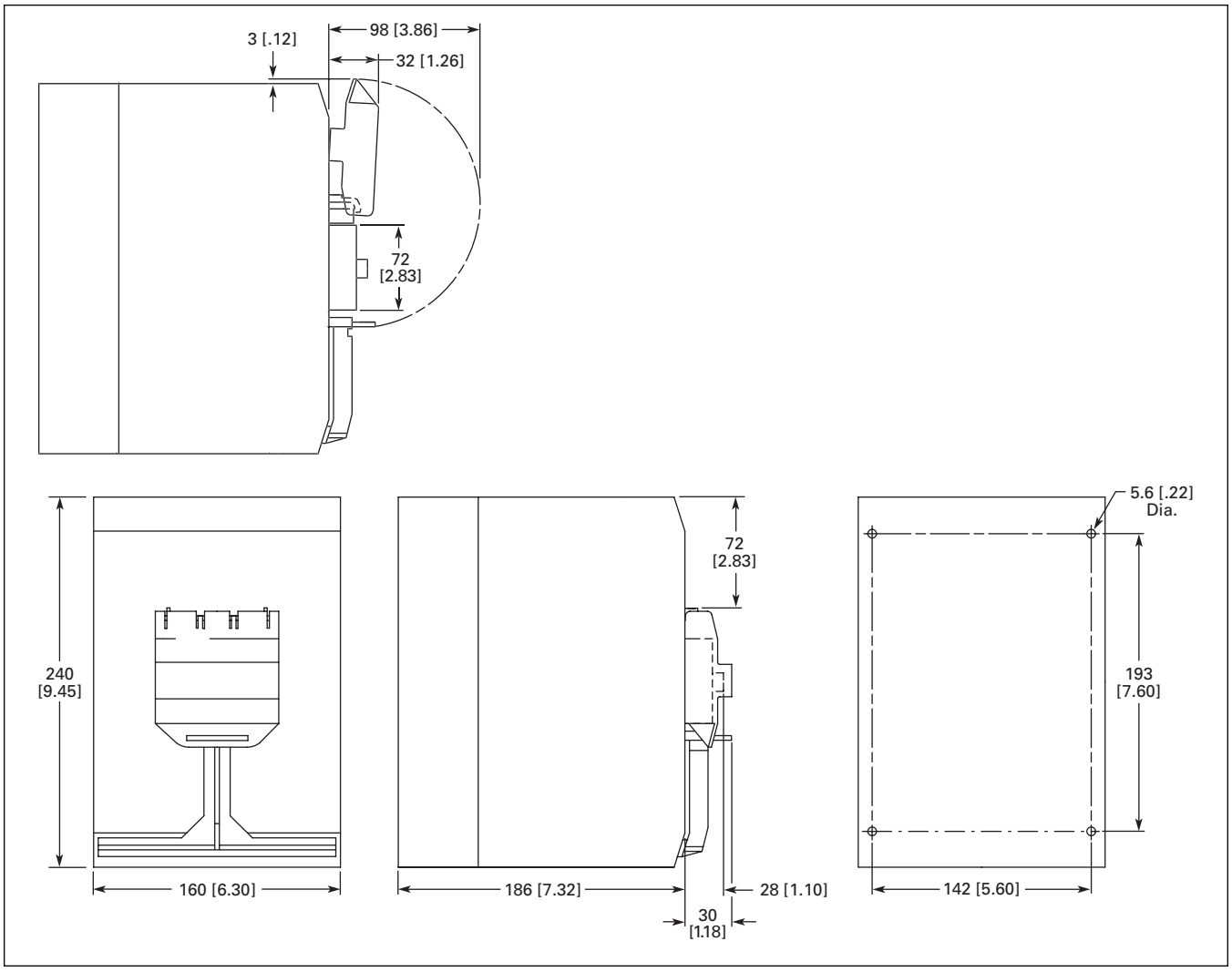


Figure 107. Insulated Enclosures for Surface Mounting — XTPAXENCSD65… + XTPAXPL2, XTPAXENCSD65 (Approximate Dimensions in mm [in])

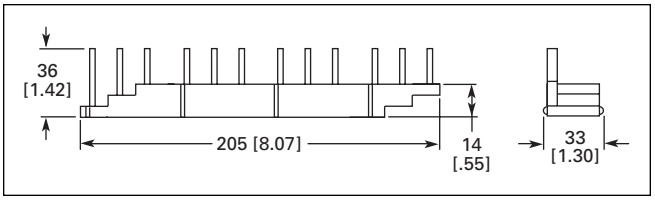


Figure 108. Three-Phase Commoning Link — XTPAXCLKA4D (Approximate Dimensions in mm [in])

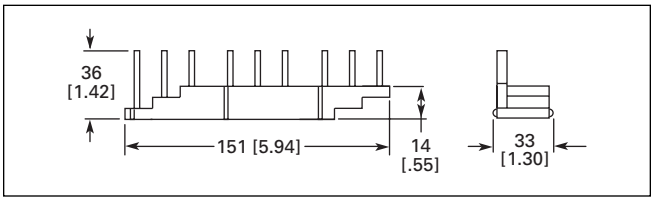


Figure 109. Three-Phase Commoning Link — XTPAXCLKA3D (Approximate Dimensions in mm [in])

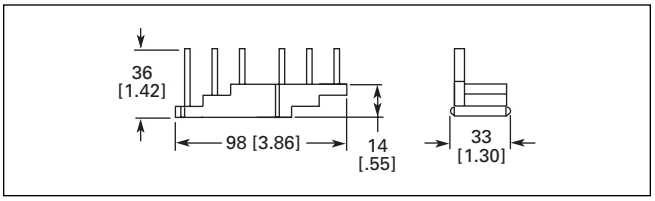


Figure 110. Three-Phase Commoning Link — XTPAXCLKA2D (Approximate Dimensions in mm [in])

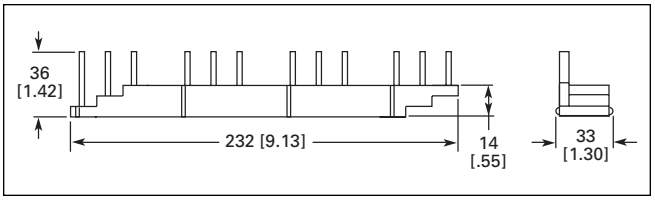


Figure 111. Three-Phase Commoning Link — XTPAXCLKB4D (Approximate Dimensions in mm [in])

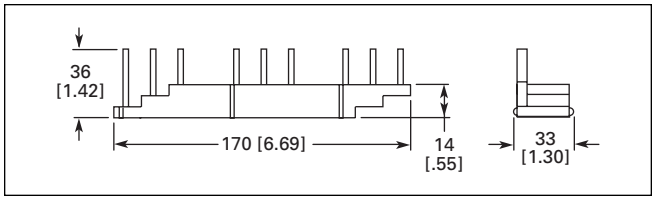


Figure 112. Three-Phase Commoning Link — XTPAXCLKB3D (Approximate Dimensions in mm [in])

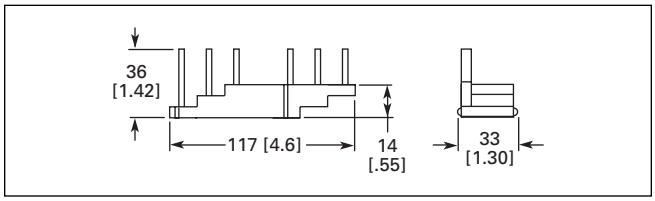


Figure 113. Three-Phase Commoning Link — XTPAXCLKB2D (Approximate Dimensions in mm [in])

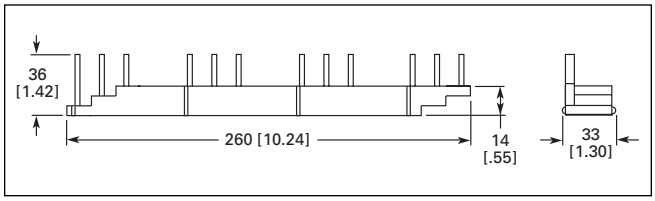


Figure 114. Three-Phase Commoning Link — XTPAXCLKC4D (Approximate Dimensions in mm [in])

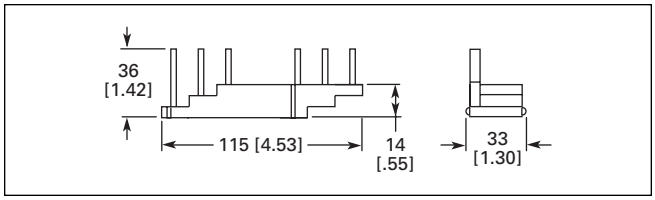


Figure 115. Three-Phase Commoning Link — XTPAXCLKC2D (Approximate Dimensions in mm [in])

Contents

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XT Combination Motor Controller and Manual Motor Controller

Product Description

The new Cutler-Hammer® XT IEC Open Non-reversing and Reversing Manual Motor Controllers from Eaton's electrical business combine a Manual Motor Protector with an IEC Contactor(s) to provide a complete motor protection solution by combining motor disconnect function, thermal overload protection, magnetic short circuit protection and remote control operation in one compact, assembled unit. These assembled Manual Motor Controllers cover motors with FLA ratings from 0.10A to 52A.

The UL 508 Type F labeled Combination Motor Controller (CMC) includes a Line Side Adapter (LSA). These assembled Combination Motor Controllers cover motors with FLA ratings from 0.10A to 52A.

Application Description

The XT IEC Non-reversing and Reversing Manual and Combination Motor Controllers can be used in the following applications:

XTSC and XTSR

- Manual Motor Controller for Single and Multi Motor Panels — The preassembled XT Manual Motor Controllers (MMC) combine a Manual Motor Protector, a Wiring Connector Link and IEC Contactor. The XTPR Manual Motor Protectors are UL listed as UL 508, Type E Self-Protected Manual Combination Starters. MMCs can also be field installed with separate MMP, WCL and Contactor(s). An IEC magnetic contactor has been added to allow for remote operation of the motor circuit.

XTFC and XTFR

- Combination Motor Controller (UL 508, Type F), for Single and Multi Motor Panels — The preassembled IEC Combination Motor Controllers combine a Line Side Adapter, Manual Motor Protector, Wiring Connector Link and IEC Contactor. The XTPR Manual Motor Protectors are UL listed as UL 508, Type E Self-Protected Manual Combination Starters. This UL listing allows these devices to be used in motor circuits without having to add separate branch short circuit protection. An IEC magnetic contactor has been added to allow for remote operation of the motor circuit.
- Group Motor Installations — Since the Manual Motor Protectors (Manual Combination Starters) are UL listed for Group Motor Installations, the IEC Manual Motor Controllers provide a compact, assembled package for Group Motor Installations up to 600V.

For Group Installations (in-panel SCPD) applying the traditional 1/3 tap rule, the Manual Motor Protectors and Combination Motor Controllers may be used on 480V Delta systems along with 480Y/277V and 600Y/347V slash rated Wye systems. For Group Installations, applying the more recent 1/10 tap conductor rule, a maximum 240V Delta is permitted or 480Y/277V and 600Y/347V slash rated Wye systems.

For actual UL 508 Type E/F applications (out-of-panel upstream feeder Short-Circuit Protective Device [SCPD] only), a maximum 240V Delta is permitted or 480Y/277V and 600Y/347V slash rated Wye systems.

For Manual "At Motor" Disconnect applications, a maximum 240V Delta is permitted or 480Y/277V and 600Y/347V slash rated Wye systems.

Features

- ON/OFF rotary handle with lockout provision
- Visible trip indication
- Test trip function
- Motor applications from 0.11A to 50A
- Class 10 overload protection
- Built-in heater and magnetic trip elements to protect the motor
- Phase loss sensitivity
- Type 2 coordination
- Ambient compensated up to 55°C [140°F]
- Control inputs located at front of starter for easy access and wiring
- Wide range of coils
- DIN Rail mount — XTSC…BB_
- Mounting plates — XTSC…BC_, XTSC…D motor controllers
- Adjustment dial for setting motor FLA
- Short circuit trip at 14 times the maximum setting of the FLA adjustment dial
- UL 508 Type F CMC High Fault Short Circuit Ratings: Refer to **Table 206**.
- 1NO-1NC Auxiliary Contact as standard on Manual Motor Protector

Standards and Certifications

UL 508 Type F Combination Motor Controller

- IEC Type 2 Approved per IEC 60947-4-1
- UL Listed File No. E218618
- CE Mark

CE

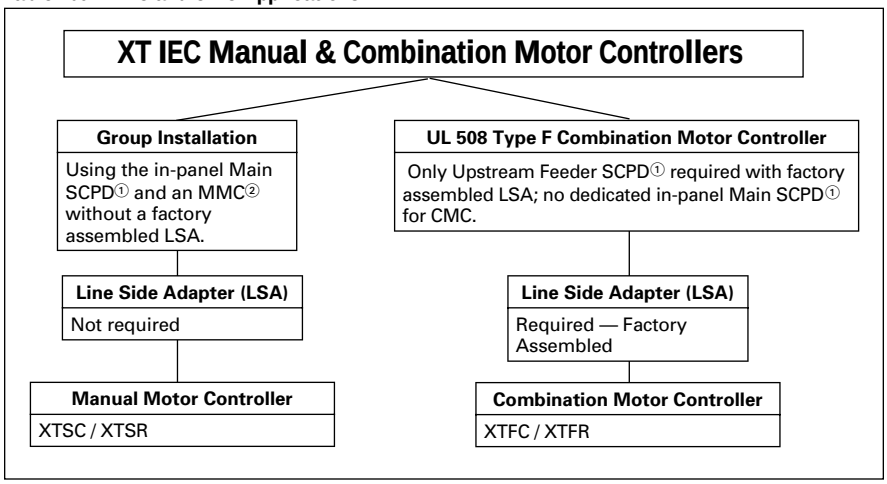
Protection in Different Controller Types

A UL 508 Type E Self-protected Manual Combination Starter/Motor Controller consists of a single device having integral short circuit protection, a main set of contacts, motor overload protection, and may also include a UL listed Line Side Adapter (See **Table 209**). This type of controller is a legitimate short circuit protective device and disconnect means for the downstream motor. It does require an upstream feeder short circuit protective device, but does not require a dedicated branch circuit protection or a disconnect means if used with a Line Side Adapter. A UL 508 Type E rating means that the unit clears a fault and does not experience any welding of the power poles. A UL 508 Type E self-protected manual motor controller will remain fully functional should a short circuit within its ratings occur. *E.g.* XTPR.

An XT UL 508 Type F Self-protected Combination Motor Controller consists of a UL Listed Type E Self-protected Manual Combination Starter/Motor Controller, a UL Listed Contactor, and a UL Listed Line Side Adapter (See **Table 209**). While the UL 508 Type E self-protected manual motor controller of this combination motor controller device is a legitimate short circuit protective device and disconnect means for the downstream motor, the contactor is *not* "self-protected." *E.g.* XTFC, XTFR.

In addition, as a complete assembly or modular components, the device should have Type 2 Coordination certification. Type 2 Coordination means the Starter or the Controller must exhibit little or no damage following a major short circuit fault and should be able to be returned to proper service without replacing any parts.

Table 209. MMC and CMC Applications


XT IEC Manual & Combination Motor Controllers
Group Installation
Using the in-panel Main SCPD① and an MMC② without a factory assembled LSA.
UL 508 Type F Combination Motor Controller
Only Upstream Feeder SCPD① required with factory assembled LSA; no dedicated in-panel Main SCPD① for CMC.
Line Side Adapter (LSA)
Not required
Line Side Adapter (LSA)
Required — Factory Assembled
Manual Motor Controller
XTSC / XTSR
Combination Motor Controller
XTFC / XTFR

① SCPD = Short Circuit Protective Device (Circuit Breaker, Fuses).
② MMC = Manual Motor Controller
Reference: Technical Paper AP03402001E.

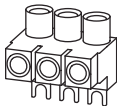
Note: Line Side Adapters are not required for non-U.S. applications. Most countries outside of the U.S. classify the MMP as a thermal magnetic circuit breaker.

Accessories

Line Side Adapters

Line Side Adapters are required for use with XTPR MMPs only when used as Type E Self-Protected Manual Combination Starters or as part of XTFC or XTFR Type F Combination Motor Controllers. Not required for Group Installation.

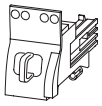
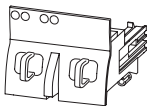
Table 210. Line Side Adapters

	Description	Catalog Number	Price
	For use with Frame B MMPs (up to 32A)	**XTPAXLSA**	
	For use with Frame D MMPs (up to 40A)	**XTPAXLSAD**	

Combination Connection Kits

Combination Connection Kits include the necessary components to field assemble a Manual Motor Controller with an MMP (XTPR) and Contactor (XTCE).

Table 211. Combination Connection Kits

	Description	Catalog Number	Price
Non-reversing			
	Includes: Mechanical & Electrical Connection Element for XTPR…B... (MMP) and XTCE…B… (Contactor).	**XTPAXTPCB**	
	Includes: Mechanical & Electrical Connection Element for XTPR…B... (MMP) and XTCE…C… (Contactor) and DIN Rail Adapter Plate.	**XTPAXTPCC**	
	Includes: Mechanical & Electrical Connection Element for XTPR…D... (MMP) and XTCE…D… (Contactor) and DIN Rail Adapter Plate.	**XTPAXTPCD**	③
Reversing			
	Includes: Mechanical & Electrical Connection Element for XTPR…B... (MMP) and (2) XTCR…B… (Contactors)	**XTPAXTPCRB**	
	Includes: Mechanical & Electrical Connection Element for XTPR…B... (MMP) and (2) XTCR…C… (Contactors) and DIN Rail Adapter Plate.	**XTPAXTPCRC**	
	Includes: Mechanical & Electrical Connection Element for XTPR…D... (MMP) and (2) XTCR…D… (Contactors) and DIN Rail Adapter Plate.	**XTPAXTPCRD**	③

③ Contact Eaton.

Discount Symbol **MC7**

Catalog Number Selection

Table 212. Combination Motor Controllers — Catalog Numbering System

XT SC 012 B B A

Design

X = XT IEC Power Control

Type

SC = Manual Motor Controller — FVNR
SR = Manual Motor Controller — FVR
FC = Combination Motor Controller, UL 508 Type F — FVNR
FR = Combination Motor Controller, UL 508 Type F — FVR

Rated Current of MMP

B-Frame	D-Frame
P16 = 0.16A	**016** = 40A
P25 = 0.25A	**025** = 58A
P40 = 0.40A	**032** = 60A
P63 = 0.63A	**040** = 16A
001 = 1A	**050** = 20A
1P6 = 1.6A	**058** = 25A
2P5 = 2.5A	**060** = 32A
004 = 4A	
6P3 = 6.3A	
010 = 10A	
012 = 12A	
016 = 16A	
020 = 20A	
025 = 25A	
032 = 32A	

Frame Size — MMP

B = 45 mm, 0.1 to 32A
D = 55 mm, 16 to 63A

Frame Size — Contactor

B = 45 mm, 7 to 15A
C = 45 mm, 18 to 32A
D = 55 mm, 40 to 65A

Coil Voltage

A = 110V 50 Hz, 120V 60 Hz
B = 220V 50 Hz, 240V 60 Hz
C = 415V 50 Hz, 480V 60 Hz
D = 550V 50 Hz, 600V 60 Hz
E = 208V 50 Hz
F = 230V 50 Hz
G = 190V 50 Hz, 220V 60 Hz
H = 240V 50 Hz, 277V 60 Hz
L = 380V 50 Hz, 440V 60 Hz
N = 400V 50 Hz
P = 380V 60 Hz
R = 12V 50/60 Hz
T = 24V 50/60 Hz
U = 24V 50 Hz
W = 42V 50 Hz, 48V 60 Hz
Y = 48V 50 Hz
AD = 120V DC
BD = 220V DC
RD = 12V DC
TD = 24V DC
WD = 48V DC

Product Selection

Table 213. XTSC Manual Motor Controllers (MMC) / Starter Combinations

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor										
FLA Adjustment Range / Overload Release — I_r (Amps) ②③	Maximum Motor Ratings ①				Catalog Number				Price	
	Motor kW Rating AC-3 — *P* (kW)	Horsepower Rating — *P* (hp)								
	3-Phase	3-Phase			Components			Assembled Manual Motor Controller ④		
	380 – 415V	230V	460V	575V	Manual Motor Protector	Combination Connection Kit	Contactor ④		AC Coil	DC Coil
Frame B MMP + Frame B Contactor										
0.16 – 0.25	0.06	②	1/2	1/2	XTPRP25BC1	XTPAXTPCB	XTCE007B10_	**XTSCP25BB_**		
0.25 – 0.4	0.09	②	1/2	1/2	XTPRP40BC1	XTPAXTPCB	XTCE007B10_	**XTSCP40BB_**		
0.4 – 0.63	0.18	②	1/2	1/2	XTPRP63BC1	XTPAXTPCB	XTCE007B10_	**XTSCP63BB_**		
0.63 – 1	0.25	②	1/2	1/2	XTPR001BC1	XTPAXTPCB	XTCE007B10_	**XTSC001BB_**		
1 – 1.6	0.55	②	3/4	1	XTPR1P6BC1	XTPAXTPCB	XTCE007B10_	**XTSC1P6BB_**		
1.6 – 2.5	0.75	1/2	1	1-1/2	XTPR2P5BC1	XTPAXTPCB	XTCE007B10_	**XTSC2P5BB_**		
2.5 – 4	1.5	1	2	3	XTPR004BC1	XTPAXTPCB	XTCE007B10_	**XTSC004BB_**		
4 – 6.3	2.2	1-1/2	3	5	XTPR6P3BC1	XTPAXTPCB	XTCE007B10_	**XTSC6P3BB_**		
6.3 – 10	4	3	7-1/2	10	XTPR010BC1	XTPAXTPCB	XTCE009B10_	**XTSC010BB_**		
8 – 12	5.5	3	7-1/2	10	XTPR012BC1	XTPAXTPCB	XTCE012B10_	**XTSC012BB_**		
Frame B MMP + Frame C Contactor										
10 – 16	7.5	3	10	10	XTPR016BC1	XTPAXTPCC	XTCE018C10_	**XTSC016BC_**		
16 – 20	9	5	10	15	XTPR020BC1	XTPAXTPCC	XTCE025C10_	**XTSC020BC_**		
20 – 25	11	7-1/2	7-1/2	20	XTPR025BC1	XTPAXTPCC	XTCE025C10_	**XTSC025BC_**		
25 – 32	15	10	10	25	XTPR032BC1	XTPAXTPCC	XTCE032C10_	**XTSC032BC_**		
Frame D MMP + Frame C Contactor										
10 – 16	7.5	5	10	15	XTPR016DC1	⑥	XTCE018C10_	**XTSC016DC_**		
16 – 25	12.5	7-1/2	15	20	XTPR025DC1	⑥	XTCE025C10_	**XTSC025DC_**		
25 – 32	15	10	25	30	XTPR032DC1	⑥	XTCE032C10_	**XTSC032DC_**		
Frame D MMP + Frame D Contactor										
32 – 40	20	10	30	30	XTPR040DC1	XTPAXTPCD ⑤	XTCE040D10_	**XTSC040DD_**		
40 – 50	25	15 ③	30 ③	40 ③	XTPR050DC1	XTPAXTPCD ⑤	XTCE050D10_	**XTSC050DD_**		
50 – 58	30	15 ③	30 ③	40 ③	XTPR058DC1	XTPAXTPCD ⑤	XTCE065D10_	**XTSC058DD_**		
55 – 63	34	15 ③	40 ③	50 ③	XTPR063DC1	XTPAXTPCD ⑤	XTCE065D10_	**XTSC063DD_**		

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only. For additional voltages not listed, see **Table 218** on **Page 167**.

② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.

③ Ratings pending UL approval. Contact Eaton for availability.

④ Underscore (_) indicates Magnetic Coil Suffix required. See **Table 217** on **Page 166**.

⑤ XTPAXTPCD — Available November 2005 and will include DIN Rail Adapter Plate (XTPAXTPCDP) and electrical contact modules (XTPAXECMD). Prior to release of XTPAXTPCD, the connection between the XTPR…DC1 and the XTCE…D… contactor will be made with flexible wire and mounted to the DIN Rail Adapter Plate (XTPAXTPCDP).

⑥ The connection between the XTPR…DC1 and the XTCE…C… contactor will be made with flexible wire and mounted to the DIN Rail Adapter Plate (XTPAXTPCDP).

Notes:

The assembled Manual Motor Controller (MMC) consists of an XTPR Manual Motor Protector (MMP) and an XTCE contactor. Up to 12A, the assembly can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCB). For 16A and above, the assembly is mounted via a DIN Rail Adapter Plate (XTPAXTPCCP) and the electrical connection is made with electrical contact modules (XTPAXECMC), both included in XTPAXTPCC.

Service Factor Settings: For motors with a service factor (SF) of 1.15, use motor nameplate Full Load Amperes (FLA) to select the appropriate motor controller —> $I_r = 1 \times I_{n\ mot}$. For motors with a service factor (SF) of 1.0 or less, multiply the motor FLA by 0.9 to select the appropriate motor controller —> $I_r = 0.9 \times I_{n\ mot}$.

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

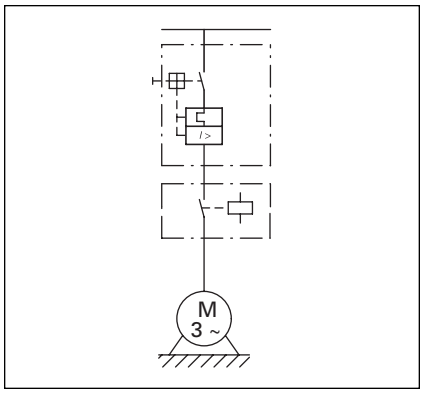


Figure 116. XTSC… Manual Motor Controller

Accessories ..... **Page 133**
Technical Data ..... **Page 167**
Discount Symbol **MC7**

Table 214. XTSR Manual Motor Controllers (MMC) / Starter Combinations — Reversing

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + (2) Contactors										
FLA Adjustment Range / Overload Release — I_r (Amps) ②③	Maximum Motor Ratings ①				Catalog Number				Price	
	Motor kW Rating AC-3 — *P* (kW)	Horsepower Rating — *P* (hp)								
	3-Phase	3-Phase			Components			Assembled Manual Motor Controller ④		
	380 – 415V	230V	460V	575V	Manual Motor Protector	Combination Connection Kit	(2) Contactor ④		AC Coil	DC Coil
Frame B MMP + (2) Frame B Contactors										
0.16 – 0.25	0.06	②	1/2	1/2	XTPRP25BC1	XTPAXTPCRB	XTCE007B01_	**XTSRP25BB_**		
0.25 – 0.4	0.09	②	1/2	1/2	XTPRP40BC1	XTPAXTPCRB	XTCE007B01_	**XTSRP40BB_**		
0.4 – 0.63	0.18	②	1/2	1/2	XTPRP63BC1	XTPAXTPCRB	XTCE007B01_	**XTSRP63BB_**		
0.63 – 1	0.25	②	1/2	1/2	XTPR001BC1	XTPAXTPCRB	XTCE007B01_	**XTSR001BB_**		
1 – 1.6	0.55	②	3/4	1	XTPR1P6BC1	XTPAXTPCRB	XTCE007B01_	**XTSR1P6BB_**		
1.6 – 2.5	0.75	1/2	1	1-1/2	XTPR2P5BC1	XTPAXTPCRB	XTCE007B01_	**XTSR2P5BB_**		
2.5 – 4	1.5	1	2	3	XTPR004BC1	XTPAXTPCRB	XTCE007B01_	**XTSR004BB_**		
4 – 6.3	2.2	1-1/2	3	5	XTPR6P3BC1	XTPAXTPCRB	XTCE007B01_	**XTSR6P3BB_**		
6.3 – 10	4	3	7-1/2	10	XTPR010BC1	XTPAXTPCRB	XTCE009B01_	**XTSR010BB_**		
8 – 12	5.5	3	7-1/2	10	XTPR012BC1	XTPAXTPCRB	XTCE012B01_	**XTSR012BB_**		
Frame B MMP + (2) Frame C Contactors										
10 – 16	7.5	3	10	10	XTPR016BC1	XTPAXTPCRC	XTCE018C01_	**XTSR016BC_**		
16 – 20	9	5	10	15	XTPR020BC1	XTPAXTPCRC	XTCE025C01_	**XTSR020BC_**		
20 – 25	11	7-1/2	7-1/2	20	XTPR025BC1	XTPAXTPCRC	XTCE025C01_	**XTSR025BC_**		
25 – 32	15	10	10	25	XTPR032BC1	XTPAXTPCRC	XTCE032C01_	**XTSR032BC_**		
Frame D MMP + (2) Frame C Contactors										
10 – 16	7.5	5	10	15	XTPR016DC1	⑥	XTCE018C01_	**XTSR016DC_**		
16 – 25	12.5	7-1/2	15	20	XTPR025DC1	⑥	XTCE025C01_	**XTSR025DC_**		
25 – 32	15	10	25	30	XTPR032DC1	⑥	XTCE032C01_	**XTSR032DC_**		
Frame D MMP + (2) Frame D Contactors										
32 – 40	20	10	30	30	XTPR040DC1	XTPAXTPCRD ⑤	XTCE040D01_	**XTSR040DD_**		
40 – 50	25	15 ③	30 ③	40 ③	XTPR050DC1	XTPAXTPCRD ⑤	XTCE050D01_	**XTSR050DD_**		
50 – 58	30	15 ③	30 ③	40 ③	XTPR058DC1	XTPAXTPCRD ⑤	XTCE065D01_	**XTSR058DD_**		
55 – 63	34	15 ③	40 ③	50 ③	XTPR063DC1	XTPAXTPCRD ⑤	XTCE065D01_	**XTSR063DD_**		

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only. For additional voltages not listed, see **Table 218** on **Page 167**.

② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.

③ Ratings pending UL approval. Contact Eaton for availability.

④ Underscore (_) indicates Magnetic Coil Suffix required. See **Table 217** on **Page 166**.

⑤ XTPAXTPCRD — Available November 2005 and will include two DIN Rail Adapter Plates (XTPAXTPCDP) and electrical contact module (XTPAXECMRD). Prior to release of XTPAXTPCD, the connection between the XTPR…DC1 and the two XTCE...D... contactors will be made with flexible wire and mounted to the DIN Rail Adapter Plates (XTPAXTPCDP).

⑥ The connection between the XTPR…DC1 and the XTCE…C… contactor will be made with flexible wire and mounted to the DIN Rail Adapter Plate (XTPAXTPCDP).

Notes:

The assembled reversing Manual Motor Controller (MMC) consists of an XTPR Manual Motor Protector (MMP) and two XTCE contactors. Up to 12A, the assembly can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCRB). For 16A and above, the assembly is mounted via a DIN Rail Adapter Plate (XTPAXTPCRCP) and the electrical connection is made with electrical contact modules (XTPAXECMC), both included in XTPAXTPCRC.

Service Factor Settings: For motors with a service factor (SF) of 1.15, use motor nameplate Full Load Amperes (FLA) to select the appropriate motor controller —> $I_r = 1 \times I_{n\ mot}$. For motors with a service factor (SF) of 1.0 or less, multiply the motor FLA by 0.9 to select the appropriate motor controller —> $I_r = 0.9 \times I_{n\ mot}$.

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

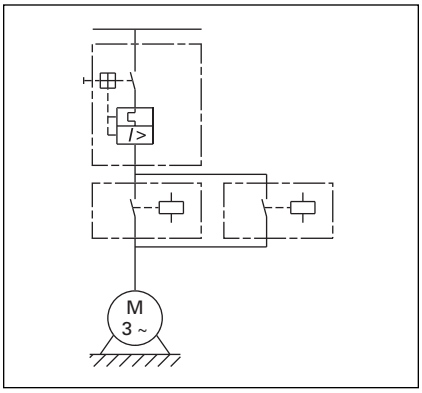


Figure 117. XTSR Manual Motor Controller

Discount Symbol **MC7**

Table 215. XTFC Combination Motor Controllers (CMC), UL 508 Type F

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor											
FLA Adjustment Range / Overload Release — I_r (Amps) ②③	Maximum Motor Ratings ①				Catalog Number					Price	
	Motor kW Rating AC-3 — *P* (kW)	Horsepower Rating — *P* (hp)									
	3-Phase	3-Phase			Components				Assembled Manual Motor Controller ④		
	380 – 415V	230V	460V	575V	Line Side Adapter	Manual Motor Protector	Combination Connection Kit	Contactor ④		AC Coil	DC Coil
Frame B MMP + Frame B Contactor											
0.16 – 0.25	0.06	②	②	②	XTPAXLSA	XTPRP25BC1	XTPAXTPCB	XTCE007B10_	**XTFCP25BB_**		
0.25 – 0.4	0.09	②	②	②	XTPAXLSA	XTPRP40BC1	XTPAXTPCB	XTCE007B10_	**XTFCP40BB_**		
0.4 – 0.63	0.18	②	②	②	XTPAXLSA	XTPRP63BC1	XTPAXTPCB	XTCE007B10_	**XTFCP63BB_**		
0.63 – 1	0.25	②	1/2	1/2	XTPAXLSA	XTPR001BC1	XTPAXTPCB	XTCE007B10_	**XTFC001BB_**		
1 – 1.6	0.55	②	3/4	1	XTPAXLSA	XTPR1P6BC1	XTPAXTPCB	XTCE007B10_	**XTFC1P6BB_**		
1.6 – 2.5	0.75	1/2	1	1-1/2	XTPAXLSA	XTPR2P5BC1	XTPAXTPCB	XTCE007B10_	**XTFC2P5BB_**		
2.5 – 4	1.5	1	2	3	XTPAXLSA	XTPR004BC1	XTPAXTPCB	XTCE007B10_	**XTFC004BB_**		
4 – 6.3	2.2	1-1/2	3	5	XTPAXLSA	XTPR6P3BC1	XTPAXTPCB	XTCE007B10_	**XTFC6P3BB_**		
6.3 – 10	4	3	7-1/2	10	XTPAXLSA	XTPR010BC1	XTPAXTPCB	XTCE009B10_	**XTFC010BB_**		
8 – 12	5.5	3	7-1/2	—	XTPAXLSA	XTPR012BC1	XTPAXTPCB	XTCE012B10_	**XTFC012BB_**		
Frame B MMP + Frame C Contactor											
10 – 16	7.5	5	10	—	XTPAXLSA	XTPR016BC1	XTPAXTPCC	XTCE018C10_	**XTFC016BC_**		
16 – 20	9	5	—	—	XTPAXLSA	XTPR020BC1	XTPAXTPCC	XTCE025C10_	**XTFC020BC_**		
20 – 25	11	7-1/2	15	—	XTPAXLSA	XTPR025BC1	XTPAXTPCC	XTCE025C10_	**XTFC025BC_**		
25 – 32	15	10	20	—	XTPAXLSA	XTPR032BC1	XTPAXTPCC	XTCE032C10_	**XTFC032BC_**		
Frame D MMP + Frame C Contactor											
10 – 16	7.5	5	10	—	XTPAXLSAD	XTPR016DC1	⑥	XTCE018C10_	**XTFC016DC_**		
16 – 25	12.5	7-1/2	20	—	XTPAXLSAD	XTPR025DC1	⑥	XTCE025C10_	**XTFC025DC_**		
25 – 32	15	10	25	—	XTPAXLSAD	XTPR032DC1	⑥	XTCE032C10_	**XTFC032DC_**		
Frame D MMP + Frame D Contactor											
32 – 40	20	10	30	—	XTPAXLSAD	XTPR040DC1	XTPAXTPCD ⑤	XTCE040D10_	**XTFC040DD_**		

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only. For additional voltages not listed, see **Table 218** on **Page 167**.

② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.

③ Ratings pending UL approval. Contact Eaton for availability.

④ Underscore (_) indicates Magnetic Coil Suffix required. See **Table 217** on **Page 166**.

⑤ XTPAXTPCD — Available November 2005 and will include DIN Rail Adapter Plate (XTPAXTPCDP) and electrical contact modules (XTPAXECMD). Prior to release of XTPAXTPCD, the connection between the XTPR…DC1 and the XTCE…D… contactor will be made with flexible wire and mounted to the DIN Rail Adapter Plate (XTPAXTPCDP).

⑥ The connection between the XTPR…DC1 and the XTCE…C… contactor will be made with flexible wire and mounted to the DIN Rail Adapter Plate (XTPAXTPCDP).

Notes:

The assembled Combination Motor Controller (CMC) consists of a UL Listed Line Side Adapter (XTPAXLSA, XTPAXLSAD), an XTPR Manual Motor Protector (MMP) and an XTCE contactor. Up to 12A, the assembly can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCB). For 16A and above, the assembly is mounted via a DIN Rail Adapter Plate (XTPAXTPCCP) and the electrical connection is made with electrical contact modules (XTPAXECMC), both included in XTPAXTPCC.

Service Factor Settings: For motors with a service factor (SF) of 1.15, use motor nameplate Full Load Amperes (FLA) to select the appropriate motor controller —> $I_r = 1 \times I_{n\ mot}$. For motors with a service factor (SF) of 1.0 or less, multiply the motor FLA by 0.9 to select the appropriate motor controller —> $I_r = 0.9 \times I_{n\ mot}$.

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

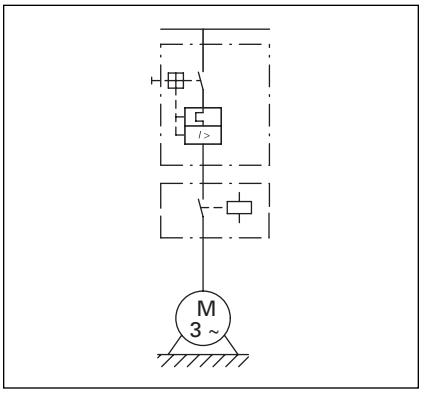


Figure 118. XTFC Combination Motor Controller

Discount Symbol **MC7**

Table 216. XTFR Combination Motor Controllers (CMC), UL 508 Type F — Reversing

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor											
FLA Adjustment Range / Overload Release — I_r (Amps) ②③	Maximum Motor Ratings ①				Catalog Number					Price	
	Motor kW Rating AC-3 — *P* (kW)	Horsepower Rating — *P* (hp)									
	3-Phase	3-Phase			Components				Assembled Manual Motor Controller ④		
	380 – 415V	230V	460V	575V	Line Side Adapter	Manual Motor Protector	Combination Connection Kit	(2) Contactor ④		AC Coil	DC Coil
Frame B MMP + (2) Frame B Contactors											
0.16 – 0.25	0.06	②	②	②	XTPAXLSA	XTPRP25BC1	XTPAXTPCRB	XTCE007B01_	**XTFRP25BB_**		
0.25 – 0.4	0.09	②	②	②	XTPAXLSA	XTPRP40BC1	XTPAXTPCRB	XTCE007B01_	**XTFRP40BB_**		
0.4 – 0.63	0.18	②	②	②	XTPAXLSA	XTPRP63BC1	XTPAXTPCRB	XTCE007B01_	**XTFRP63BB_**		
0.63 – 1	0.25	②	1/2	1/2	XTPAXLSA	XTPR001BC1	XTPAXTPCRB	XTCE007B01_	**XTFR001BB_**		
1 – 1.6	0.55	②	3/4	1	XTPAXLSA	XTPR1P6BC1	XTPAXTPCRB	XTCE007B01_	**XTFR1P6BB_**		
1.6 – 2.5	0.75	1/2	1	1-1/2	XTPAXLSA	XTPR2P5BC1	XTPAXTPCRB	XTCE007B01_	**XTFR2P5BB_**		
2.5 – 4	1.5	1	2	3	XTPAXLSA	XTPR004BC1	XTPAXTPCRB	XTCE007B01_	**XTFR004BB_**		
4 – 6.3	2.2	1-1/2	3	5	XTPAXLSA	XTPR6P3BC1	XTPAXTPCRB	XTCE007B01_	**XTFR6P3BB_**		
6.3 – 10	4	3	7-1/2	10	XTPAXLSA	XTPR010BC1	XTPAXTPCRB	XTCE009B01_	**XTFR010BB_**		
8 – 12	5.5	3	7-1/2	—	XTPAXLSA	XTPR012BC1	XTPAXTPCRB	XTCE012B01_	**XTFR012BB_**		
Frame B MMP + (2) Frame C Contactors											
10 – 16	7.5	5	10	—	XTPAXLSA	XTPR016BC1	XTPAXTPCRC	XTCE018C01_	**XTFR016BC_**		
16 – 20	9	5	—	—	XTPAXLSA	XTPR020BC1	XTPAXTPCRC	XTCE025C01_	**XTFR020BC_**		
20 – 25	11	7-1/2	15	—	XTPAXLSA	XTPR025BC1	XTPAXTPCRC	XTCE025C01_	**XTFR025BC_**		
25 – 32	15	10	20	—	XTPAXLSA	XTPR032BC1	XTPAXTPCRC	XTCE032C01_	**XTFR032BC_**		
Frame D MMP + (2) Frame C Contactors											
10 – 16	7.5	5	10	—	XTPAXLSAD	XTPR016DC1	⑥	XTCE018C01_	**XTFR016DC_**		
16 – 25	12.5	7-1/2	20	—	XTPAXLSAD	XTPR025DC1	⑥	XTCE025C01_	**XTFR025DC_**		
25 – 32	15	10	25	—	XTPAXLSAD	XTPR032DC1	⑥	XTCE032C01_	**XTFR032DC_**		
Frame D MMP + (2) Frame D Contactors											
32 – 40	20	10	30	—	XTPAXLSAD	XTPR040DC1	XTPAXTPCRD ⑤	XTCE040D01_	**XTFR040DD_**		

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only. For additional voltages not listed, see **Table 218** on **Page 167**.

② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.

③ Ratings pending UL approval. Contact Eaton for availability.

④ Underscore (_) indicates Magnetic Coil Suffix required. See **Table 217** on **Page 166**.

⑤ XTPAXTPCD — Available November 2005 and will include DIN Rail Adapter Plate (XTPAXTPCDP) and electrical contact modules (XTPAXECMRD). Prior to release of XTPAXTPCRD, the connection between the XTPR…DC1 and the XTCE…D… contactor will be made with flexible wire and mounted to the DIN Rail Adapter Plate (XTPAXTPCDP).

⑥ The connection between the XTPR…DC1 and the XTCE…C… contactor will be made with flexible wire and mounted to the DIN Rail Adapter Plate (XTPAXTPCDP).

Notes:

The assembled reversing Combination Motor Controller (CMC) consists of a UL Listed Line Side Adapter (XTPAX-LSA, XTPAXLSAD), an XTPR Manual Motor Protector (MMP) and two XTCE contactors. Up to 12A, the assembly can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCB). For 16A and above, the assembly is mounted via a DIN Rail Adapter Plate (XTPAXTPRCP) and the electrical connection is made with electrical contact modules (XTPAXECMC), both included in XTPAXTPCRC.

Service Factor Settings: For motors with a service factor (SF) of 1.15, use motor nameplate Full Load Amperes (FLA) to select the appropriate motor controller —> $I_r = 1 \times I_{n\ mot}$. For motors with a service factor (SF) of 1.0 or less, multiply the motor FLA by 0.9 to select the appropriate motor controller —> $I_r = 0.9 \times I_{n\ mot}$.

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

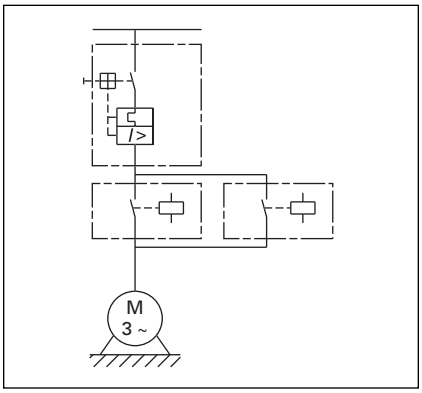


Figure 119. XTFR Combination Motor Controller

Discount Symbol **MC7**

Table 217. AC and DC Coil Suffixes

Coil Voltage	Suffix Code
Frame B Contactors	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD** ②
415V 50 Hz, 480V 60 Hz	**C** ①
550V 50 Hz, 600V 60 Hz	**D** ①
208V 60 Hz	**E** ①
190V 50 Hz, 220V 60 Hz	**G** ①
240V 50 Hz, 277V 60 Hz	**H** ①
380V 50 Hz, 440V 60 Hz	**L** ①
400V 50 Hz	**N** ①
380V 60 Hz	**P** ①
12V 50/60 Hz	**R** ①
24V 50 Hz	**U** ①
42V 50 Hz, 48V 60 Hz	**W** ①
48V 50 Hz	**Y** ①
120V DC	**AD** ①②
220V DC	**BD** ①②
12V DC	**RD** ①②
48V DC	**WD** ①②

Coil Voltage	Suffix Code
Frame C and D Contactors	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24 – 27V DC	**TD** ②
415V 50 Hz, 480V 60 Hz	**C** ①
550V 50 Hz, 600V 60 Hz	**D** ①
208V 60 Hz	**E** ①
190V 50 Hz, 220V 60 Hz	**G** ①
240V 50 Hz, 277V 60 Hz	**H** ①
380V 50 Hz, 440V 60 Hz	**L** ①
400V 50 Hz	**N** ①
380V 60 Hz	**P** ①
12V 50/60 Hz	**R** ①
24V 50 Hz	**U** ①
42V 50 Hz, 48V 60 Hz	**W** ①
48V 50 Hz	**Y** ①
110 – 130V DC	**AD** ①②
200 – 240V DC	**BD** ①②
12 – 14V DC	**RD** ①②③
48 – 60V DC	**WD** ①②

① For indicated coils, price adder of 10% must be applied to the MMC list price in **Table 216**.
② With DC Operation: Integrated diode-resistor combination, coil rating 2.6W.
③ Available October 2005.

Technical Data and Specifications

Table 218. XTSC Manual Motor Controllers (MMC) and XTFC Combination Motor Controllers (CMC) / Starter Combinations — Motor Ratings

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor(s)														
Catalog Number		FLA Adjustment Range / Overload Release — I_r (Amps)	Maximum Motor Ratings — *P* ①											
			Maximum Motor kW Rating AC-3 — P (kW)					Maximum hp Rating — *P* (HP)						
			Three-Phase					Single-Phase			Three-Phase			
Assembled Manual/ Combination Motor Controller — Non-reversing ④	Assembled Manual/ Combination Motor Controller — Reversing ④		220-240V	380-415V	440V	500V	660-690V	115V	200V	230V	200V	230V	460V	575V
XTSC & XTSR Manual Motor Controllers (MMC) / Starter Combinations														
XTSCP25BB_	**XTSRP25BB_**	0.16 – 0.25	—	0.06	0.06	0.06	0.12	②	②	②	②	②	1/2	1/2
XTSCP40BB_	**XTSRP40BB_**	0.25 – 0.4	0.06	0.09	0.12	0.12	0.18	②	②	②	②	②	1/2	1/2
XTSCP63BB_	**XTSRP63BB_**	0.4 – 0.63	0.09	0.18	0.18	0.25	0.25	②	②	②	②	②	1/2	1/2
XTSC001BB_	**XTSR001BB_**	0.63 – 1	0.12	0.25	0.25	0.37	0.55	②	②	②	②	②	1/2	1/2
XTSC1P6BB_	**XTSR1P6BB_**	1 – 1.6	0.25	0.55	0.55	0.75	1.1	②	②	1/10	②	②	3/4	1
XTSC2P5BB_	**XTSR2P5BB_**	1.6 – 2.5	0.37	0.75	1.1	1.1	1.5	—	1/8	1/6	1/2	1/2	1	1-1/2
XTSC004BB_	**XTSR004BB_**	2.5 – 4	0.75	1.5	1.5	2.2	3	1/8	1/4	1/3	1	1	2	3
XTSC6P3BB_	**XTSR6P3BB_**	4 – 6.3	1.1	2.2	3	3	4	1/4	1/2	1/2	1-1/2	1-1/2	3	5
XTSC010BB_	**XTSR010BB_**	6.3 – 10	2.2	4	4	4	7.5	1/2	1	1-1/2	3	3	7-1/2	10
XTSC012BB_	**XTSR012BB_**	8 – 12	3	5.5	5.5	5.5	11	1/2	1	1-1/2	3	3	7-1/2	10
XTSC016BC_	**XTSR016BC_**	10 – 16	4	7.5	9	9	12.5	1	2	2	3	3	10	10
XTSC020BC_	**XTSR020BC_**	16 - 20	5.5	9	11	12.5	15	1-1/2	3	3	5	5	10	15
XTSC025BC_	**XTSR025BC_**	20 – 25	5.5	11	12.5	15	22	1-1/2	3	3	5	7-1/2	7-1/2	20
XTSC032BC_	**XTSR032BC_**	25 – 32	7.5	15	15	22	30	—	—	5	7.5	10	10	25
XTSC016DC_	**XTSR016DC_**	10 – 16	4	7.5	9	9	12.5	1	2	3	3	5	10	15
XTSC025DC_	**XTSR025DC_**	16 – 25	5.5	12.5	12.5	12.5	22	2	3	3	7-1/2	7-1/2	15	20
XTSC032DC_	**XTSR032DC_**	25 – 32	7.5	15	17.5	17.5	22	3	5	5	10	10	25	30
XTSC040DD_	**XTSR040DD_**	32 – 40	11	20	22	22	30	3	5	7-1/2	10	10	30	30
XTSC050DD_	**XTSR050DD_**	40 – 50	14	25	30	30	45	—	—	7-1/2	—	15 ③	30 ③	40 ③
XTSC058DD_	**XTSR058DD_**	50 – 58	17	30	37	37	55	—	—	—	10 ③	15 ③	30 ③	40 ③
XTSC063DD_	**XTSR063DD_**	55 – 63	18.5	34	37	37	55	—	—	—	15 ③	15 ③	40 ③	50 ③
XTFC & XTFR Combination Motor Controllers (CMC), UL 508 Type F														
XTFCP25BB_	**XTFRP25BB_**	0.16 – 0.25	—	0.06	0.06	0.06	0.12	②	②	②	②	②	②	②
XTFCP40BB_	**XTFRP40BB_**	0.25 – 0.4	0.06	0.09	0.12	0.12	0.18	②	②	②	②	②	②	②
XTFCP63BB_	**XTFRP63BB_**	0.4 – 0.63	0.09	0.18	0.18	0.25	0.25	②	②	②	②	②	②	②
XTFC001BB_	**XTFR001BB_**	0.63 – 1	0.12	0.25	0.25	0.37	0.55	②	②	②	②	②	1/2	1/2
XTFC1P6BB_	**XTFR1P6BB_**	1 – 1.6	0.25	0.55	0.55	0.75	1.1	②	②	1/10	②	②	3/4	1
XTFC2P5BB_	**XTFR2P5BB_**	1.6 – 2.5	0.37	0.75	1.1	1.1	1.5	—	1/8	1/6	1/2	1/2	1	1-1/2
XTFC004BB_	**XTFR004BB_**	2.5 – 4	0.75	1.5	1.5	2.2	3	1/8	1/4	1/3	1	1	2	3
XTFC6P3BB_	**XTFR6P3BB_**	4 – 6.3	1.1	2.2	3	3	4	1/4	1/2	1/2	1-1/2	1-1/2	3	5
XTFC010BB_	**XTFR010BB_**	6.3 – 10	2.2	4	4	4	7.5	1/2	1	1-1/2	3	2	7-1/2	10
XTFC012BB_	**XTFR012BB_**	8 – 12	3	5.5	5.5	5.5	11	1/2	1	1-1/2	3	3	7-1/2	—
XTFC016BC_	**XTFR016BC_**	10 – 16	4	7.5	9	9	12.5	1	2	2	3	5	10	—
XTFC020BC_	**XTFR020BC_**	16 - 20	5.5	9	11	12.5	15	1-1/2	3	3	5	5	—	—
XTFC025BC_	**XTFR025BC_**	20 – 25	5.5	11	12.5	15	22	1-1/2	3	3	5	7-1/2	15	—
XTFC032BC_	**XTFR032BC_**	25 – 32	7.5	15	15	22	30	—	—	5	7-1/2	10	20	—
XTFC016DC_	**XTFR016DC_**	10 – 16	4	7.5	9	9	12.5	1	2	3	3	5	10	—
XTFC025DC_	**XTFR025DC_**	16 – 25	5.5	12.5	12.5	12.5	22	2	3	3	7-1/2	7-1/2	20	—
XTFC032DC_	**XTFR032DC_**	25 – 32	7.5	15	17.5	17.5	22	3	5	5	10	10	25	—
XTFC040DD_	**XTFR040DD_**	32 – 40	11	20	22	22	30	3	5	7-1/2	10	10	30	—

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.
② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.
③ Ratings pending UL approval. Contact Eaton for availability.
④ Underscore (_) indicates Magnetic Coil Suffix required. See **Table 217** on **Page 166**.

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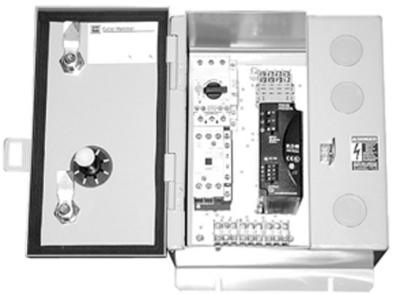


Enclosed XT CMC

Product Description

The Cutler-Hammer® XT Line from Eaton's electrical business includes IEC Contactors, Starters and Combination Motor Controllers (CMCs). Designed to meet International Standards, the Enclosed Control XT Line (ECX), carries CE, UL and cUL certifications to support the IEC and NEMA markets.

Features and Benefits

- ON/OFF rotary handle with lockout provision
- Visible trip indication
- Test trip function
- Motor applications from 0.11A to 50A
- Class 10 overload protection
- Built-in heater and magnetic trip elements to protect the motor
- Phase loss sensitivity
- Type 2 coordination
- Ambient compensated up to 55°C [140°F]
- Control inputs located at front of starter for easy access and wiring
- Wide range of coils
- DIN Rail mount — XTSC…BB_
- Mounting plates — XTSC…BC_, XTSC…D motor controllers
- Adjustment dial for setting motor FLA
- Short circuit trip at 14 times the maximum setting of the FLA adjustment dial
- UL 508 Type F CMC High Fault Short Circuit Ratings: Refer to **Table 206**.
- Nonmetallic and metallic enclosures in Types 1 (IP23), 4 (IP66), 4X (IP66) and 12 (IP65)
- Circuit breakers, North American or European fuses available
- Opaque (standard) or clear covers available on nonmetallic Halyester enclosure)

Standards and Certifications

- UL Listed
- cUL Listed (indicates appropriate CSA Standard investigation)
- CE Marked

Cover Control

- Cover control for Combination Motor Control Starters uses E22 style (22 mm).
- Selector switches are maintained with lever operators.
- Pushbuttons are momentary type with extended pushbutton.
- The kit includes hardware and connecting wires (where possible).
- For factory installed control devices other than shown below, refer to Modification Codes, **Page 117**.

Table 219. Combination Motor Controller Cover Control

Description	Factory Installed ①		Field Kits	
	Position 9 Cover Control Code	Combination Only Adder	Catalog Number	Price
Kits for Non-reversing				
START/STOP Pushbuttons (PB)	**B**	—	**CE400T01**	
START/STOP PB & Red RUN Light	**C**	—	**CE400T02** ②	
START/STOP PB, Red RUN, & Green STOPPED Light	**D**	—	**CE400T03** ②	
HAND/OFF/AUTO Selector Switch (SS)	**H**	—	**CE400T04**	
H-O-A SS & Red RUN Light	**J**	—	**CE400T05** ②	
H-O-A SS, Red RUN, & Green STOPPED Light	**K**	—	**CE400T06** ②	
Red RUN Pilot Light	**P**	—	**CE400T10** ②	
Green Off Pilot Light	**Q**	—	**CE400T11** ②	
Red RUN/Green OFF Pilot Light	**R**	—	**CE400T12** ②	
ON/OFF Selector Switch (SS)	**S**	—	**CE400T07**	
ON/OFF SS, Red RUN Light	**T**	—	**CE400T08** ②	
ON/OFF SS, Red RUN, & Green STOPPED Light	**U**	—	**CE400T09** ②	
Kits for Full Voltage Reversing				
FWD/REV/STOP Pushbuttons (PB)	**B**	—	**CE400T50**	
FWD/REV/STOP PB + Red FWD & REV Lights	**C**	—	**CE400T51** ②	
FWD/REV/STOP PB, Red FWD/REV, & Green STOPPED	**D**	—	**CE400T52** ②	
FOR/OFF/REV Selector Switch (SS)	**H**	—	**CE400T53**	
FOR/OFF/REV SS + Red FWD & REV Lights	**J**	—	**CE400T54** ②	
FOR/OFF/REV SS, Red FWD/REV, & Green STOPPED	**K**	—	**CE400T55** ②	
OPEN/OFF/CLOSE Selector Switch (SS)	**V**	—	**CE400T56**	
OPEN/OFF/CLOSE SS + Red FWD & REV Lights	**W**	—	**CE400T57** ②	
OPEN/OFF/CLOSE SS, Red FWD/REV, & Green STOPPED	**X**	—	**CE400T58** ②	

① To include any of the above cover controls, place the control code character in position 9 of your Catalog Number. Example: ECX77H1A**D**A Full voltage non-reversing fusible starter with interchangeable heater OLR and START/STOP pushbutton with red RUN and green OFF pilot lights.

② Suffix for lights (required for field installed kits only) in chart below:

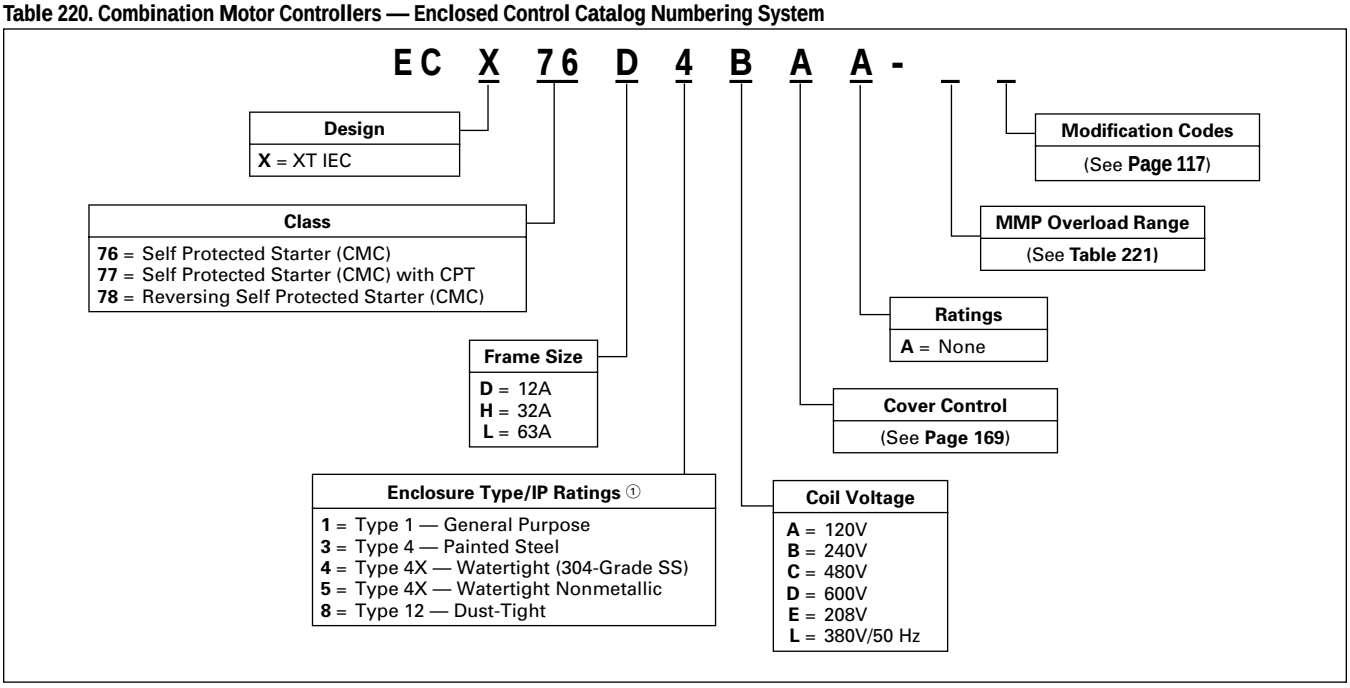
Rating	Catalog Suffix	Rating	Catalog Suffix
120V 60 Hz	**A**	277V 60 Hz	**H**
208V 60 Hz	**E**	380V 50 Hz	**L**
240V 60 Hz	**B**	460V 60 Hz	**C**
		600V 60 Hz	**D**

Note: All CMC design built in enclosure Size 5 do not contain a CPT. In order to supply internal power for cover control, the enclosure must increase to Size 6. If control power is to be supplied from a source outside of the enclosure, there is no need to oversize. Note that 32A and less FVNR designs permit room for a 24V DC power supply to be installed.

Discount Symbol **MC7**

Catalog Number Selection

Table 220. Combination Motor Controllers — Enclosed Control Catalog Numbering System


EC X 76 D 4 B A A -
Design
X = XT IEC
Class
76 = Self Protected Starter (CMC)
77 = Self Protected Starter (CMC) with CPT
78 = Reversing Self Protected Starter (CMC)
Frame Size
D = 12A
H = 32A
L = 63A
Enclosure Type/IP Ratings ①
1 = Type 1 — General Purpose
3 = Type 4 — Painted Steel
4 = Type 4X — Watertight (304-Grade SS)
5 = Type 4X — Watertight Nonmetallic
8 = Type 12 — Dust-Tight
Coil Voltage
A = 120V
B = 240V
C = 480V
D = 600V
E = 208V
L = 380V/50 Hz
Cover Control
(See Page 169)
Ratings
A = None
MMP Overload Range
(See Table 221)
Modification Codes
(See Page 117)

① See **Table 234** on **Page 184** for Enclosure Type/IP Ratings Cross-Reference.

Table 221. XTPR MMP Amperage Ranges

XT MMP Catalog Number	Overload Amp Range	Enclosed Control Suffix Code
Frame B Rotary MMP		
XTPRP16BC1	.1 – .16	**A**
XTPRP25BC1	.16 – .25	**B**
XTPRP40BC1	.25 – .4	**C**
XTPRP63BC1	.4 – .63	**D**
XTPR001BC1	.63 – 1	**E**
XTPR1P6BC1	1 – 1.6	**F**
XTPR2P5BC1	1.6 – 2.5	**G**
XTPR004BC1	2.5 – 4	**H**
XTPR6P3BC1	4 – 6.3	**J**
XTPR010BC1	6.3 – 10	**K**
XTPR012BC1	8 – 12.0	**L**
XTPR016BC1	10 – 16.0	**M**
XTPR020BC1	16 – 20	**N**
XTPR025BC1	20 – 25	**Q**
XTPR032BC1	25 – 32	**R**
Frame D Rotary MMP		
XTPR016DC1	10 – 16.0	**M**
XTPR025DC1	16 – 25	**P**
XTPR032DC1	25 – 32	**R**
XTPR040DC1	32 – 40	**S**
XTPR050DC1	40 – 50	**T**
XTPR058DC1	50 – 58	**U**
XTPR063DC1	55 – 63	**V**

Product Selection

Table 222. Class 76 — XT Self Protected Starter (CMC) — Type 1 and Type 4X

Size	Amps	Maximum hp ①			Coil voltage @ 60 Hz ②	Type 1/IP23		Type 4X/IP66 ④		Component ③
		Motor Voltage	1-phase	3-phase		Catalog Number	Price	Catalog Number	Price	Catalog Number
D	12	115	1/2	—	120	**ECX76D1AAA-_**		**ECX76D4AAA-_**		**XTPR_ _ _BC1**
		200	1-1/2	3	208	**ECX76D1EAA-_**		**ECX76D4EAA-_**		
		230	2	3	240	**ECX76D1BAA-_**		**ECX76D4BAA-_**		
		380	—	5	380/50 Hz	**ECX76D1LAA-_**		**ECX76D4LAA-_**		
		460	—	7-1/2	480	**ECX76D1CAA-_**		**ECX76D4CAA-_**		
		575	—	10	600	**ECX76D1DAA-_**		**ECX76D4DAA-_**		
H	32	115	3	—	120	**ECX76H1AAA-_**		**ECX76H4AAA-_**		**XTPR_ _ _BC1**
		200	5	10	208	**ECX76H1EAA-_**		**ECX76H4EAA-_**		
		230	5	10	240	**ECX76H1BAA-_**		**ECX76H4BAA-_**		
		380	—	15	380/50 Hz	**ECX76H1LAA-_**		**ECX76H4LAA-_**		
		460	—	20	480	**ECX76H1CAA-_**		**ECX76H4CAA-_**		
		575	—	25	600	**ECX76H1DAA-_**		**ECX76H4DAA-_**		
L	63	115	5	—	120	**ECX76L1AAA-_**		**ECX76L4AAA-_**		**XTPR_ _ _DC1**
		200	10	20	208	**ECX76L1EAA-_**		**ECX76L4EAA-_**		
		230	15	25	240	**ECX76L1BAA-_**		**ECX76L4BAA-_**		
		380	—	30	380/50 Hz	**ECX76L1LAA-_**		**ECX76L4LAA-_**		
		460	—	50	480	**ECX76L1CAA-_**		**ECX76L4CAA-_**		
		575	—	60	600	**ECX76L1DAA-_**		**ECX76L4DAA-_**		

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 170**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX76D**4**AAA-_. To order Type 4 Painted Steel, change that digit to **3**.

Table 223. Class 76 — XT Self Protected Starter (CMC) — Type 4X Nonmetallic and Type 12

Size	Amps	Maximum hp ⑤			Coil voltage @ 60 Hz ⑥	Type 4X Nonmetallic/IP66		Type 12/IP65		Component ⑦
		Motor Voltage	1-phase	3-phase		Catalog Number	Price	Catalog Number	Price	Catalog Number
D	12	115	1/2	—	120	**ECX76D5AAA-_**		**ECX76D8AAA-_**		**XTPR_ _ _BC1**
		200	1-1/2	3	208	**ECX76D5EAA-_**		**ECX76D8EAA-_**		
		230	2	3	240	**ECX76D5BAA-_**		**ECX76D8BAA-_**		
		380	—	5	380/50 Hz	**ECX76D5LAA-_**		**ECX76D8LAA-_**		
		460	—	7-1/2	480	**ECX76D5CAA-_**		**ECX76D8CAA-_**		
		575	—	10	600	**ECX76D5DAA-_**		**ECX76D8DAA-_**		
H	32	115	3	—	120	**ECX76H5AAA-_**		**ECX76H8AAA-_**		**XTPR_ _ _BC1**
		200	5	10	208	**ECX76H5EAA-_**		**ECX76H8EAA-_**		
		230	5	10	240	**ECX76H5BAA-_**		**ECX76H8BAA-_**		
		380	—	15	380/50 Hz	**ECX76H5LAA-_**		**ECX76H8LAA-_**		
		460	—	20	480	**ECX76H5CAA-_**		**ECX76H8CAA-_**		
		575	—	25	600	**ECX76H5DAA-_**		**ECX76H8DAA-_**		
L	63	115	5	—	120	**ECX76L5AAA-_**		**ECX76L8AAA-_**		**XTPR_ _ _DC1**
		200	10	20	208	**ECX76L5EAA-_**		**ECX76L8EAA-_**		
		230	15	25	240	**ECX76L5BAA-_**		**ECX76L8BAA-_**		
		380	—	30	380/50 Hz	**ECX76L5LAA-_**		**ECX76L8LAA-_**		
		460	—	50	480	**ECX76L5CAA-_**		**ECX76L8CAA-_**		
		575	—	60	600	**ECX76L5DAA-_**		**ECX76L8DAA-_**		

⑤ 1 hp = 1.014 kW.
⑥ Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
⑦ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 170**.

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Table 224. Class 77 — XT Self Protected Starter (CMC) with CPT — Type 1 and Type 4X

Size	Amps	Maximum hp ①			Coil voltage @ 60 Hz ②	Type 1/IP23		Type 4X/IP66 ④		Component ③
		Motor Voltage	1-phase	3-phase		Catalog Number	Price	Catalog Number	Price	Catalog Number
D	12	115	1/2	—	120	ECX77D1AAA-_		ECX77D4AAA-_		XTPR_ _ _BC1
		200	1-1/2	3	208	ECX77D1EAA-_		ECX77D4EAA-_		
		230	2	3	240	ECX77D1BAA-_		ECX77D4BAA-_		
		380	—	5	380/50 Hz	ECX77D1LAA-_		ECX77D4LAA-_		
		460	—	7-1/2	480	ECX77D1CAA-_		ECX77D4CAA-_		
		575	—	10	600	ECX77D1DAA-_		ECX77D4DAA-_		
H	32	115	3	—	120	ECX77H1AAA-_		ECX77H4AAA-_		XTPR_ _ _BC1
		200	5	10	208	ECX77H1EAA-_		ECX77H4EAA-_		
		230	5	10	240	ECX77H1BAA-_		ECX77H4BAA-_		
		380	—	15	380/50 Hz	ECX77H1LAA-_		ECX77H4LAA-_		
		460	—	20	480	ECX77H1CAA-_		ECX77H4CAA-_		
		575	—	25	600	ECX77H1DAA-_		ECX77H4DAA-_		
L	63	115	5	—	120	ECX77L1AAA-_		ECX77L4AAA-_		XTPR_ _ _DC1
		200	10	20	208	ECX77L1EAA-_		ECX77L4EAA-_		
		230	15	25	240	ECX77L1BAA-_		ECX77L4BAA-_		
		380	—	30	380/50 Hz	ECX77L1LAA-_		ECX77L4LAA-_		
		460	—	50	480	ECX77L1CAA-_		ECX77L4CAA-_		
		575	—	60	600	ECX77L1DAA-_		ECX77L4DAA-_		

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 170**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX77D**4**AAA-_. To order Type 4 Painted Steel, change that digit to **3**.

Table 225. Class 77 — XT Self Protected Starter (CMC) with CPT — Type 4X Nonmetallic and Type 12

Size	Amps	Maximum hp ⑤			Coil voltage @ 60 Hz ⑥	Type 4X Nonmetallic/IP66		Type 12/IP65		Component ⑦
		Motor Voltage	1-phase	3-phase		Catalog Number	Price	Catalog Number	Price	Catalog Number
D	12	115	1/2	—	120	ECX77D5AAA-_		ECX77D8AAA-_		XTPR_ _ _BC1
		200	1-1/2	3	208	ECX77D5EAA-_		ECX77D8EAA-_		
		230	2	3	240	ECX77D5BAA-_		ECX77D8BAA-_		
		380	—	5	380/50 Hz	ECX77D5LAA-_		ECX77D8LAA-_		
		460	—	7-1/2	480	ECX77D5CAA-_		ECX77D8CAA-_		
		575	—	10	600	ECX77D5DAA-_		ECX77D8DAA-_		
H	32	115	3	—	120	ECX77H5AAA-_		ECX77H8AAA-_		XTPR_ _ _BC1
		200	5	10	208	ECX77H5EAA-_		ECX77H8EAA-_		
		230	5	10	240	ECX77H5BAA-_		ECX77H8BAA-_		
		380	—	15	380/50 Hz	ECX77H5LAA-_		ECX77H8LAA-_		
		460	—	20	480	ECX77H5CAA-_		ECX77H8CAA-_		
		575	—	25	600	ECX77H5DAA-_		ECX77H8DAA-_		
L	63	115	5	—	120	ECX77L5AAA-_		ECX77L8AAA-_		XTPR_ _ _DC1
		200	10	20	208	ECX77L5EAA-_		ECX77L8EAA-_		
		230	15	25	240	ECX77L5BAA-_		ECX77L8BAA-_		
		380	—	30	380/50 Hz	ECX77L5LAA-_		ECX77L8LAA-_		
		460	—	50	480	ECX77L5CAA-_		ECX77L8CAA-_		
		575	—	60	600	ECX77L5DAA-_		ECX77L8DAA-_		

⑤ 1 hp = 1.014 kW.
⑥ Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
⑦ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 170**.

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Table 226. Class 78 — XT Reversing Self Protected Starter (CMC) — Type 1 and Type 4X

Size	Amps	Maximum hp ①			Coil voltage @ 60 Hz ②	Type 1/IP23		Type 4X/IP66 ④		Component ③
		Motor Voltage	1-phase	3-phase		Catalog Number	Price	Catalog Number	Price	Catalog Number
D	12	115	1/2	—	120	**ECX78D1AAA-_**		**ECX78D4AAA-_**		**XTPR_ _ _BC1**
		200	1-1/2	3	208	**ECX78D1EAA-_**		**ECX78D4EAA-_**		
		230	2	3	240	**ECX78D1BAA-_**		**ECX78D4BAA-_**		
		380	—	5	380/50 Hz	**ECX78D1LAA-_**		**ECX78D4LAA-_**		
		460	—	7-1/2	480	**ECX78D1CAA-_**		**ECX78D4CAA-_**		
		575	—	10	600	**ECX78D1DAA-_**		**ECX78D4DAA-_**		
H	32	115	3	—	120	**ECX78H1AAA-_**		**ECX78H4AAA-_**		**XTPR_ _ _BC1**
		200	5	10	208	**ECX78H1EAA-_**		**ECX78H4EAA-_**		
		230	5	10	240	**ECX78H1BAA-_**		**ECX78H4BAA-_**		
		380	—	15	380/50 Hz	**ECX78H1LAA-_**		**ECX78H4LAA-_**		
		460	—	20	480	**ECX78H1CAA-_**		**ECX78H4CAA-_**		
		575	—	25	600	**ECX78H1DAA-_**		**ECX78H4DAA-_**		
L	63	115	5	—	120	**ECX78L1AAA-_**		**ECX78L4AAA-_**		**XTPR_ _ _DC1**
		200	10	20	208	**ECX78L1EAA-_**		**ECX78L4EAA-_**		
		230	15	25	240	**ECX78L1BAA-_**		**ECX78L4BAA-_**		
		380	—	30	380/50 Hz	**ECX78L1LAA-_**		**ECX78L4LAA-_**		
		460	—	50	480	**ECX78L1CAA-_**		**ECX78L4CAA-_**		
		575	—	60	600	**ECX78L1DAA-_**		**ECX78L4DAA-_**		

① 1 hp = 1.014 kW.
② Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
③ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 170**.
④ These are the Catalog Numbers for Type 4X 304-Grade Stainless Steel, as indicated by the seventh digit **4**. Example: ECX78D**4**AAA-_. To order Type 4 Painted Steel, change that digit to **3**.

Table 227. Class 78 — XT Reversing Self Protected Starter (CMC) — Type 4X Nonmetallic and Type 12

Size	Amps	Maximum hp ⑤			Coil voltage @ 60 Hz ⑥	Type 4X Nonmetallic/IP66		Type 12/IP65		Component ⑦
		Motor Voltage	1-phase	3-phase		Catalog Number	Price	Catalog Number	Price	Catalog Number
D	12	115	1/2	—	120	**ECX78D5AAA-_**		**ECX78D8AAA-_**		**XTPR_ _ _BC1**
		200	1-1/2	3	208	**ECX78D5EAA-_**		**ECX78D8EAA-_**		
		230	2	3	240	**ECX78D5BAA-_**		**ECX78D8BAA-_**		
		380	—	5	380/50 Hz	**ECX78D5LAA-_**		**ECX78D8LAA-_**		
		460	—	7-1/2	480	**ECX78D5CAA-_**		**ECX78D8CAA-_**		
		575	—	10	600	**ECX78D5DAA-_**		**ECX78D8DAA-_**		
H	32	115	3	—	120	**ECX78H5AAA-_**		**ECX78H8AAA-_**		**XTPR_ _ _BC1**
		200	5	10	208	**ECX78H5EAA-_**		**ECX78H8EAA-_**		
		230	5	10	240	**ECX78H5BAA-_**		**ECX78H8BAA-_**		
		380	—	15	380/50 Hz	**ECX78H5LAA-_**		**ECX78H8LAA-_**		
		460	—	20	480	**ECX78H5CAA-_**		**ECX78H8CAA-_**		
		575	—	25	600	**ECX78H5DAA-_**		**ECX78H8DAA-_**		
L	63	115	5	—	120	**ECX78L5AAA-_**		**ECX78L8AAA-_**		**XTPR_ _ _DC1**
		200	10	20	208	**ECX78L5EAA-_**		**ECX78L8EAA-_**		
		230	15	25	240	**ECX78L5BAA-_**		**ECX78L8BAA-_**		
		380	—	30	380/50 Hz	**ECX78L5LAA-_**		**ECX78L8LAA-_**		
		460	—	50	480	**ECX78L5CAA-_**		**ECX78L8CAA-_**		
		575	—	60	600	**ECX78L5DAA-_**		**ECX78L8DAA-_**		

⑤ 1 hp = 1.014 kW.
⑥ Voltage is listed @ 60 Hz unless otherwise noted. Other voltages available upon request.
⑦ Select proper "XTPR" MMP Overload Amperage range as per motor FLA, see **Page 170**.

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Technical Data, Contactors ..... **Page 54**
Cover Control ..... **Page 169**
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Discount Symbol **MC7**

Dimensions

Enclosure Boxes

Type 1, 3R, 4, 4X, 12 XT Combination Motor Controllers (CMCs)

Table 228. Class 76 — Self Protected Starter (CMC)

IEC Size (Frame/Amps)	Box Number	Ship Weight kg [lbs]
B – H/up to 32A	5A	6.8 [15]
B – H/up to 32A	5P	5.4 [12]
J – L/40 – 63A	5A	8.2 [18]
J – L/40 – 63A	5P	6.4 [14]

Table 229. Class 77 — Self Protected Starter (CMC) with CPT

IEC Size (Frame/Amps)	Box Number	Ship Weight kg [lbs]
B – H/up to 32A	6A	9.5 [21]
B – H/up to 32A	6P	7.0 [17]
J – L/40 – 63A	6A	11 [24]
J – L/40 – 63A	6P	8.6 [19]

Table 230. Class 78 — Reversing Self Protected Starter (CMC)

IEC Size (Frame/Amps)	Box Number	Ship Weight kg [lbs]
B – H/7 – 32A	5A	7.0 [16]
B – H/7 – 32A	5P	5.2 [12]
J – L/40 – 63A	6A	9.8 [22]
J – L/40 – 63A	6P	7.7 [17]

Box Dimensions

For Box Dimensions, See *Enclosed Control Product Guide*, PG03300001E.

Approvals for World Markets

Overview

The XT line of products is approved for use throughout the world, including the USA and Canada. As such, they can be used without restriction as devices for world markets.

The majority of countries permit the import of devices on the manufacturer's undertaking that they have been constructed in accordance with the pertinent specifications. In the USA and Canada, however, there is a legal obligation to obtain official approval. In these countries, devices and enclosures — sometimes even complete control systems — are tested and approved by independent bodies.

In Europe, there also used to be a legal obligation to obtain official approval for low-voltage switchgear and controlgear. For industrial control gear, this legal obligation has now been abolished, provided the devices have been manufactured and tested in accordance with harmonized European standards (such as IEC/EN 60947). There is then no longer a requirement for them to carry their country's own approval mark.

Since January 1997, all devices must conform to the European Low-Voltage Directive and, where intended for sale within the European Union, must carry the CE mark.

Europe
Conformité Européen
(CE)

This mark denotes that the device carrying it conforms to all relevant requirements and specifications. The mandatory application of this mark therefore enables the unrestricted use of marked devices within the European economic area.

Since January 1996, all devices sold within the European union must comply with the Electromagnetic Compatibility (EMC) Directive. XT has passed the required tests to these Directives, and the devices carry the CE mark, demonstrating compliance with the EMC Directive. *Because devices bearing the CE mark comply with the harmonized standards, approval and the associated marking is no longer required in the following countries:*

Belgium
Comité Electro-technique Belge
Belgisch Elektro-technisch Comité
(CEBEC)

Denmark
Danmarks Elektriske Materielkontrol
(DEMKO)

Finland
(FIMKO)

France
Union Technique de l'Electricité
(UTE)

Netherlands
Naamloze Vennootschap tot Keuring van Electrotechnische Materialien
(KEMA)

Norway
Norges Elektriske Materiellkontrol
(NEMKO)

Sweden
Svenska Elektriska Materiel-Kontrollanstalten
(SEMKO)

Switzerland
Schweizerischer Elektrotechischer Verein
(SEV)

Devices the USA and Canada have UL and CSA approval.

USA
Underwriters Laboratories
(UL)

Listing

Recognition

Canada
Canadian Standards Association
(CSA)

Recently introduced is the mandatory approval of electrical products for:

- Slovakia
- Poland
- South Africa
- China
- Russia
- Turkey
- Argentina

Marking is partly mandatory for these countries. The IEC rating data is accepted as in other European countries.

Approval is not mandatory in the Czech Republic and Hungary. The manufacturer's declaration of conformity is sufficient here.

Romania requires that components that are to be used in public buildings must be approved by the Romanian test authority ICECON.

Russia
Devices for Russia must bear the appropriate marking.

Russia
Goststandart
(GOST-R)

South Africa
ZA
SABS

Argentina

Selection of Devices

"Selection appropriate for export" does not mean merely meeting the requisite approvals and conformity to relevant specifications. The meaning of the term goes a great deal further by even including that equipment and installations must be designed to a concept with export in mind.

The following are important criteria for selecting switchgear suitable for export:

- **For motor-protective circuit-breakers**
  Use inherently short-circuit proof switches capable of controlling the highest prospective fault levels at the point of installation without the need for back-up protection.
  - ❑ **Advantage:**
    - – No restrictions whatsoever for installation
    - – Complete independence from the on-site protective system
    - – No problems getting spare parts
- **For circuit-breakers**
  Use types with visible contacts, quick-make and quick-break operation as standard. Use current-limiting circuit-breakers for high short-circuit levels. Selective switches are recommended for the selective graduation of networks.
  - ❑ **Advantage:**
    - – Independence from local accident prevention regulations requiring visible contacts, and safety faults caused by inexperienced operating personnel.
    - – The effects of short-circuits are kept to a minimum.
    - – Fuseless installations offer greater safety and reliability in plant operation. In the event of a fault, only the faulty section of the system is isolated.
- **For contactors**
  Use contactors whose entire range provides consistently reliable operation in the event of voltage drops (consistently down to 80% U_n should be aimed for) and whose contact system will not assume an indeterminate position either on closing or on opening in such conditions.
  - ❑ **Advantage:**
    - – During the electrification work in areas such as Africa and the Middle East, an insufficient voltage stability is — at least for a certain time — likely in many applications (for example due to long spur lines or small local generators). The use of devices that fulfill the above requirements will eliminate one of the main failure causes related to contactors.
- **For enclosures**
  Use insulated enclosures with transparent covers (i.e. "totally insulated" enclosures).
  - ❑ **Advantage:**
    - – Total insulation is the best possible protective measure from the user's point of view, avoiding reliance on the possibly doubtful skills of unknown installation personnel. Furthermore, protective measures based on earthing are often extremely difficult, if not impossible (in the Middle East, for example, due to the dryness of the ground).
    - – Insulated enclosures completely eliminate the need for any additional protection against corrosion. The transparent covers contribute significantly to the correct operation of a system, because switchgear operation can be monitored even with the doors or covers closed, thus virtually eliminating the possibility of these being left open through carelessness. The transparent cover is an important contribution to safety, especially where exports to areas of uncertain skills are concerned.
- **For overcurrent protective devices**
  Always use circuit-breakers and motor-protective circuit-breakers. Avoid fuses as far as possible.
  - ❑ **Advantage:**
    - – The operational reliability of a system is especially important for export contracts. Circuit-breakers and motor-protective circuit-breakers provide this reliability in full measure since they can be immediately reclosed once a fault has been cleared, they disconnect all poles, they have ideal protection through high tripping accuracy and they can be used for selective operation. Because they have no fuses or other consumables, they also greatly reduce the problem of obtaining replacement parts. The advantages of fuseless design for export are especially evident in this case. No complicated investigation is needed to find out which fusing system is used in the respective location and which specifications have to be followed to select the correct fuses. Often several different fuse systems with widely varying characteristics are used side-by-side in the same country. For the uninitiated, it may be almost impossible to find the right fuse in these circumstances. These problems do not arise where a circuit-breaker is used.
- **For main switches and safety switches**
  Use devices with positive contact separation and clear switch position indication.
  - ❑ **Advantage:**
    - – The mechanical coupling of the actuating element with the contacts ensues that the OFF position is indicated only when all main contacts are separated by the prescribed distance, and only in this position can the switch be padlocked. This ensures safety when carrying out maintenance and repair work on the installation or machinery.

Test Authorities

USA
USA
UL

Canada
CDN
CSA

Romania
RO
ICECON
ML PAT

Russia
RUS
GOST-R

South Africa
ZA
SABS

Slovakia
SK
SKTC

Poland
PL
BBJ-SEP

Turkey
TR
TSE

China
PRC
CCC

Ukraine
UA
Ukrain-GOST

Shipping Classifications

Germany
Germanischer Lloyd
(GL)

Great Britain
Lloyd's Register of
Shipping (LR)

France
Bureau Veritas (BV)

Russia
Russian Maritime
Register of Shipping
(RS)

Italy
Registro Italiano Navale
(RINA)

Norway
Det Norske Veritas
(DNV)

Poland
Polski Rejestr Statkow
(PRS)

Approvals for North America

In the USA, the legally established OSHA (Occupational Safety and Health Act) and the NEC (National Electrical Code) require the use of approved devices and systems.

In Canada, all electrical apparatus must comply with the CEC (Canadian Electrical Code), requires that all equipment and installations have CSA approval.

In addition to the normal UL and CSA approvals, the trade regulations originating from the NAFTA agreements allow the application for a joint UL and CSA approval. The devices then carry a logo that is recognized in both countries.

Some local inspectors and end users still refuse to accept the joint listing.

Table 231. Approvals for North America

Type of Approval	Approval Mark
The device is UL- and CSA-approved as discrete device.	
The device is CSA-approved as discrete device.	
The device is UL-approved as discrete device.	
The device contains UL-approved components; its approval conditions must be maintained in use (UL Recognized). The device is CSA-approved as discrete device.	

IEC Utilization Categories

(See also IEC/EN 60947-1; 2.1.18/IEV 441-17-19)

A combination of specified requirements relating to the condition in which the switching device or fuse fulfills its purpose and selected to represent a characteristic group of real-life applications. The specified requirements may, for example, relate to the values of making and breaking capacity and other characteristic values, data concerning associated circuits and the applicable conditions of use and operational behavior.

Table 232. Used in Technical Data & Formulas

Code	Descriptions
DF	Duty factory
$I_{\Delta n}$	Response value of earth-fault release
I_{cm}	Rated short-circuit making capacity
I_{cn}	Rated short-circuit breaking capacity
I_{cs}	Rated service short-circuit breaking capacity
I_{cu}	Rated ultimate short-circuit breaking capacity
I_{cw}	Rated short-time withstand current
I_e	Rated operational current
I_k	Transformer initial short-circuit AC current
I_L	Load monitoring response value
I_n	Rated current
I_{NT}	Transformer rated current
I_{PK}	Rated peak withstand current
I_q	Rated conditional short-circuit current
I_r	Overcurrent release set value
I_{rm}	Response value of non-delayed short-circuit release
I_i	Response value of non-delayed short-circuit release
I_{rmf}	Response value of fixed, non-delayed short-circuit release
I_{rmv}	Response value of short-time delayed short-circuit release
I_{sd}	Response value of short-time delayed short-circuit release
I_T	Response value of earth-fault release
I_g	Response value of earth-fault release
I_{th}	Conventional free air thermal current
I_{the}	Conventional thermal current of enclosed devices
I_u	Rated uninterrupted current
S_{NT}	Transformer rating
t_r	Time delay of overload release response
t_T	Time delay of earth-fault release response
t_g	Time delay of earth-fault release response
t_v	Time delay of short-circuit release response
U_c	Rated actuating voltage
U_e	Rated operational voltage
U_i	Rated insulation voltage
U_{imp}	Rated impulse withstand voltage
U_k	Transformer short-circuit voltage
U_s	Rated control voltage

Annex A (informative)

Table 233. Examples of Utilization Categories for Low-Voltage Switchgear and Controlgear ①

Category	Typical Applications	Relevant IEC Product Standard
Nature of Current — AC		
AC-1	Non-inductive or slightly inductive loads, resistance furnaces	60947-4-1
AC-2	Slip-ring motors: starting, switching off	60947-4-1
AC-3	Squirrel-cage motors: starting, switching off motors during running	60947-4-1
AC-4	Squirrel-cage motors: starting, plugging ②, inching ③	60947-4-1
AC-5a	Switching of electric discharge lamp controls	60947-4-1
AC-5b	Switching of incandescent lamps	60947-4-1
AC-6a	Switching of transformers	60947-4-1
AC-6b	Switching of capacitor banks	60947-4-1
AC-7a	Slightly inductive loads for household appliances and similar applications	61095
AC-7b	Motor-loads for household applications	61095
AC-8a	Hermetic refrigerant compressor motor control with manual resetting of overload releases	60947-4-1
AC-8b	Hermetic refrigerant compressor motor control with automatic resetting of overload releases	60947-4-1
AC-12	Control of resistive loads and solid-state loads with isolation by optocouplers	60947-5-1
AC-12	Control of resistive loads and solid-state loads with optical isolation	60947-5-2
AC-13	Control of solid-state loads with transformer isolation	60947-5-1
AC-14	Control of small electromagnetic loads	60947-5-1
AC-15	Control of AC electromagnetic loads	60947-5-1
AC-20	Connecting and disconnecting under no-load conditions	60947-3
AC-21	Switching of resistive loads, including moderate overloads	60947-3
AC-22	Switching of mixed resistive and inductive loads, including moderate overloads	60947-3
AC-23	Switching of motor loads or other highly inductive loads	60947-3

① 60947-1 © IEC: 2004.

② By plugging is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.

③ By inching (jogging) is understood energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

Annex A (informative)

Table 233. Examples of Utilization Categories for Low-Voltage Switchgear and Controlgear ① (Continued)

Category	Typical Applications	Relevant IEC Product Standard
Nature of Current — AC (Continued)		
AC-31	Non inductive or slightly inductive loads	60947-6-1
AC-33	Motor loads or mixed loads including motors, resistive loads and up to 30% incandescent lamp loads	60947-6-1
AC-35	Electric discharge lamp loads	60947-6-1
AC-36	Incandescent lamp loads	60947-6-1
AC-40	Distribution circuits comprising mixed resistive and reactive loads having a resultant inductive reactance	60947-6-2
AC-41	Non-inductive or slightly inductive loads, resistance furnaces	60947-6-2
AC-42	Slip-ring motors: starting, switching off	60947-6-2
AC-43	Squirrel-cage motors: starting, switching off motors during running	60947-6-2
AC-44	Squirrel-cage motors: starting, plugging ②, inching ③	60947-6-2
AC-45a	Switching of electric discharge lamp controls	60947-6-2
AC-45b	Switching of incandescent lamps	60947-6-2
AC-51	Non-inductive or slightly inductive loads, resistance furnaces	60947-4-3
AC-52a	Control of slip ring motor stators: 8 h duty with on-load currents for start, acceleration, run	60947-4-2
AC-52b	Control of slip ring motor stators: intermittent duty	60947-4-2
AC-53a	Control of squirrel-cage motors: 8 h duty with on-load currents for start, acceleration, run	60947-4-2
AC-53b	Control of squirrel-cage motors: intermittent duty	60947-4-2
AC-55a	Switching of electric discharge lamp controls	60947-4-3
AC-55b	Switching of incandescent lamps	60947-4-3
AC-56a	Switching of transformers	60947-4-3
AC-56b	Switching of capacitor banks	60947-4-3
AC-58a	Control of hermetic refrigerant compressor motors with automatic resetting of overload releases: 8 h duty with on-load currents for start, acceleration, run	60947-4-2
AC-58b	Control of hermetic refrigerant compressor motors with automatic resetting of overload releases: intermittent duty	60947-4-2
AC-140	Control of small electromagnetic loads with holding (closed) current ≤ 0,2 A, e.g. contactor relays	60947-5-2
Nature of Current — AC and DC		
A	Protection of circuits, with no rated short-time withstand current	60947-2
B	Protection of circuits, with a rated short-time withstand current	60947-2
Nature of Current — DC		
DC-1	Non-inductive or slightly inductive loads, resistance furnaces	60947-4-1
DC-3	Shunt-motors: starting, plugging ②, inching ③, Dynamic breaking of motors	60947-4-1
DC-5	Series-motors: starting, plugging ②, inching ③, Dynamic breaking of motors	60947-4-1
DC-6	Switching of incandescent lamps	60947-4-1
DC-12	Control of resistive loads and solid-state loads with isolation by optocouplers	60947-5-1
DC-12	Control of resistive loads and solid-state loads with optical isolation	60947-5-2
DC-13	Control of electromagnets	60947-5-1
DC-13	Control of electromagnets	60947-5-2
DC-14	Control of electromagnetic loads having economy resistors in circuit	60947-5-1
DC-20	Connecting and disconnecting under no-load conditions	60947-3
DC-21	Switching of resistive loads, including moderate overloads	60947-3
DC-22	Switching of mixed resistive and inductive loads, including moderate overloads (e.g. shunt motors)	60947-3
DC-23	Switching of motor loads or other highly inductive loads (e.g. series motors)	60947-3
DC-31	Resistive loads	60947-6-1
DC-33	Motor loads or mixed loads including motors	60947-6-1
DC-36	Incandescent lamp loads	60947-6-1
DC-40	Distribution circuits comprising mixed resistive and reactive loads having a resultant inductive reactance	60947-6-2
DC-41	Non-inductive or slightly inductive loads, resistance furnaces	60947-6-2
DC-43	Shunt-motors: starting, plugging ②, inching ③, Dynamic breaking of DC	60947-6-2
DC-45	Series-motors: starting, plugging ②, inching ③, Dynamic breaking of DC	60947-6-2
DC-46	Switching of incandescent lamps	60947-6-2

① 60947-1 © IEC: 2004.

② By plugging is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.

③ By inching (jogging) is understood energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

Motor Ratings Data

Ampere Rating of AC and DC Motors

Ampere ratings of motors vary somewhat, depending upon the type of motor. The values given below are for drip-proof, Class B insulated (T Frame) where available, 1.15 service factor, NEMA Design B motors. These values represent an average full load motor current which was calculated from the motor performance data published by several motor manufacturers. In the case of high torque squirrel cage motors, the ampere ratings will be at least 10% greater than the values given below.

Caution — These average ratings could be high or low for a specific motor and therefore heater coil selection on this basis always involves risk. For fully reliable motor protection, select heater coils on the basis of full load current rating as shown on the motor nameplate.

Ampere Ratings of Three-Phase, 60 Hz, AC Induction Motor

hp	Syn. Speed RPM	Current in Amperes					
		200V	230V	380V ①	460V	575V	2200V
1/4	1800	1.09	.95	.55	.48	.38	—
	1200	1.61	1.40	.81	.70	.56	—
	900	1.84	1.60	.93	.80	.64	—
1/3	1800	1.37	1.19	.69	.60	.48	—
	1200	1.83	1.59	.92	.80	.64	—
	900	2.07	1.80	1.04	.90	.72	—
1/2	1800	1.98	1.72	.99	.86	.69	—
	1200	2.47	2.15	1.24	1.08	.86	—
	900	2.74	2.38	1.38	1.19	.95	—
3/4	1800	2.83	2.46	1.42	1.23	.98	—
	1200	3.36	2.92	1.69	1.46	1.17	—
	900	3.75	3.26	1.88	1.63	1.30	—
1	3600	3.22	2.80	1.70	1.40	1.12	—
	1800	4.09	3.56	2.06	1.78	1.42	—
	1200	4.32	3.76	2.28	1.88	1.50	—
	900	4.95	4.30	2.60	2.15	1.72	—
1-1/2	3600	5.01	4.36	2.64	2.18	1.74	—
	1800	5.59	4.86	2.94	2.43	1.94	—
	1200	6.07	5.28	3.20	2.64	2.11	—
	900	6.44	5.60	3.39	2.80	2.24	—
2	3600	6.44	5.60	3.39	2.80	2.24	—
	1800	7.36	6.40	3.87	3.20	2.56	—
	1200	7.87	6.84	4.14	3.42	2.74	—
	900	9.09	7.90	4.77	3.95	3.16	—
3	3600	9.59	8.34	5.02	4.17	3.34	—
	1800	10.8	9.40	5.70	4.70	3.76	—
	1200	11.7	10.2	6.20	5.12	4.10	—
	900	13.1	11.4	6.90	5.70	4.55	—
5	3600	15.5	13.5	8.20	6.76	5.41	—
	1800	16.6	14.4	8.74	7.21	5.78	—
	1200	18.2	15.8	9.59	7.91	6.32	—
	900	18.3	15.9	9.60	7.92	6.33	—
7-1/2	3600	22.4	19.5	11.8	9.79	7.81	—
	1800	24.7	21.5	13.0	10.7	8.55	—
	1200	25.1	21.8	13.2	10.9	8.70	—
	900	26.5	23.0	13.9	11.5	9.19	—
10	3600	29.2	25.4	15.4	12.7	10.1	—
	1800	30.8	26.8	16.3	13.4	10.7	—
	1200	32.2	28.0	16.9	14.0	11.2	—
	900	35.1	30.5	18.5	15.2	12.2	—
15	3600	41.9	36.4	22.0	18.2	14.5	—
	1800	45.1	39.2	23.7	19.6	15.7	—
	1200	47.6	41.4	25.0	20.7	16.5	—
	900	51.2	44.5	26.9	22.2	17.8	—
20	3600	58.0	50.4	30.5	25.2	20.1	—
	1800	58.9	51.2	31.0	25.6	20.5	—
	1200	60.7	52.8	31.9	26.4	21.1	—
	900	63.1	54.9	33.2	27.4	21.9	—
25	3600	69.9	60.8	36.8	30.4	24.3	—
	1800	74.5	64.8	39.2	32.4	25.9	—
	1200	75.4	65.6	39.6	32.8	26.2	—
	900	77.4	67.3	40.7	33.7	27.0	—
30	3600	84.8	73.7	44.4	36.8	29.4	—
	1800	86.9	75.6	45.7	37.8	30.2	—
	1200	90.6	78.8	47.6	39.4	31.5	—
	900	94.1	81.8	49.5	40.9	32.7	—
40	3600	111	96.4	58.2	48.2	38.5	—
	1800	116	101	61.0	50.4	40.3	—
	1200	117	102	61.2	50.6	40.4	—
	900	121	105	63.2	52.2	41.7	—
50	3600	138	120	72.9	60.1	48.2	—
	1800	143	124	75.2	62.2	49.7	—
	1200	145	126	76.2	63.0	50.4	—
	900	150	130	78.5	65.0	52.0	—
60	3600	164	143	86.8	71.7	57.3	—
	1800	171	140	90.0	74.5	59.4	—
	1200	173	150	91.0	75.0	60.0	—
	900	177	154	93.1	77.0	61.5	—
75	3600	206	179	108	89.6	71.7	—
	1800	210	183	111	91.6	73.2	—
	1200	212	184	112	92.0	73.5	—
	900	222	193	117	96.5	77.5	—
100	3600	266	231	140	115	92.2	—
	1800	271	236	144	118	94.8	23.6
	1200	275	239	145	120	95.6	24.2
	900	290	252	153	126	101	24.8
125	3600	—	292	176	146	116	—
	1800	—	293	177	147	117	29.2
	1200	—	298	180	149	119	29.9
	900	—	305	186	153	122	30.9
150	3600	—	343	208	171	137	—
	1800	—	348	210	174	139	34.8
	1200	—	350	210	174	139	35.5
	900	—	365	211	183	146	37.0
200	3600	—	452	257	226	181	—
	1800	—	458	265	229	184	46.7
	1200	—	460	266	230	184	47.0
	900	—	482	279	241	193	49.4
250	3600	—	559	338	279	223	—
	1800	—	568	343	284	227	57.5
	1200	—	573	345	287	229	58.5
	900	—	600	347	300	240	60.5
300	1800	—	678	392	339	271	69.0
	1200	—	684	395	342	274	70.0
400	1800	—	896	518	448	358	91.8
500	1800	—	1110	642	555	444	116

① 380V 50 Hz.

Single-Phase AC Motors

Table 430-148. **Full-Load Currents in Amperes, Single-Phase Alternating-Current Motors**

The following values of full-load currents are for motors running at usual speeds and motors with normal torque characteristics. Motors built for especially low speeds or high torques may have higher full-load currents and multispeed motors will have full-load current varying with speed, in which case the nameplate current ratings shall be used.

The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120 and 220 to 240V.

hp	115V	200V	208V	230V
1/6	4.4	2.5	2.4	2.2
1/4	5.8	3.3	3.2	2.9
1/3	7.2	4.1	4.0	3.6
1/2	9.8	5.6	5.4	4.9
3/4	13.8	7.9	7.6	6.9
1	16	9.2	8.8	8
1-1/2	20	11.5	11	10
2	24	13.8	13.2	12
3	34	19.6	18.7	17
5	56	32.2	30.8	28
7-1/2	80	46	44	40
10	100	57.5	55	50

Three-Phase AC Motors

The following values of full-load currents are typical for motors running at speeds usual for belted motors and motors with normal torque characteristics.

Motors built for low speeds (1,200 RPM or less) or high torques may require more running current and multispeed motors will have full-load current varying with speed. In these cases the nameplate current rating shall be used.

The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120, 220 to 240, 440 to 480 and 550 to 600V.

DC Motors

Table 430-147. **Full-Load Current in Amperes, Direct-Current Motors**

The following values of full-load currents are for motors running at base speed.

Note: These are average direct-current quantities.

hp	Armature Voltage Rating ②		Ampere Capacity of Fuses for Motors	
			Recommended Values	
	120V	240V	120V	240V
1/4	3.1	1.6	5	3
1/3	4.1	2.0	5	3
1/2	5.4	2.7	7	3
3/4	7.6	3.8	10	5
1	9.5	4.7	15	7
1-1/2	13.2	6.6	20	10
2	17	8.5	25	12
3	25	12.2	30	15
5	40	20	50	25
7-1/2	58	29	80	40
10	76	38	100	50
15	—	55	—	75
20	—	72	—	100
25	—	89	—	125
30	—	106	—	150
40	—	140	—	200
50	—	173	—	250
60	—	206	—	275
75	—	255	—	350
100	—	341	—	500
125	—	425	—	600
150	—	506	—	—
200	—	675	—	—

② These are average direct-current quantities.

Table 430-150. **Full-Load Current Three-Phase Alternating-Current Motors**

hp	Induction Type Squirrel-Cage and Wound-Rotor Amperes							Synchronous Type Unity Power Factor ① Amperes			
	115V	200V	208V	230V	460V	575V	2300V	230V	460V	575V	2300V
1/2	4.4	2.5	2.4	2.2	1.1	.9	—	—	—	—	—
3/4	6.4	3.7	3.5	3.2	1.6	1.3	—	—	—	—	—
1	8.4	4.8	4.6	4.2	2.1	1.7	—	—	—	—	—
1-1/2	12.0	6.9	6.6	6.0	3.0	2.4	—	—	—	—	—
2	13.6	7.8	7.5	6.8	3.4	2.7	—	—	—	—	—
3	—	11.0	10.6	9.6	4.8	3.9	—	—	—	—	—
5	—	17.5	16.7	15.2	7.6	6.1	—	—	—	—	—
7-1/2	—	25.3	24.2	22	11	9	—	—	—	—	—
10	—	32.2	30.8	28	14	11	—	—	—	—	—
15	—	48.3	46.2	42	21	17	—	—	—	—	—
20	—	62.1	59.4	54	27	22	—	—	—	—	—
25	—	78.2	74.8	68	34	27	—	53	26	21	—
30	—	92	88	80	40	32	—	63	32	26	—
40	—	120	114	104	52	41	—	83	41	33	—
50	—	150	143	130	65	52	—	104	52	42	—
60	—	177	169	154	77	62	16	123	61	49	12
75	—	221	211	192	96	77	20	155	78	62	15
100	—	285	273	248	124	99	26	202	101	81	20
125	—	359	343	312	156	125	31	253	126	101	25
150	—	414	396	360	180	144	37	302	151	121	30
200	—	552	528	480	240	192	49	400	201	161	40
250	—	—	—	—	302	242	60	—	—	—	—
300	—	—	—	—	361	289	72	—	—	—	—
350	—	—	—	—	414	336	83	—	—	—	—
400	—	—	—	—	477	382	95	—	—	—	—
450	—	—	—	—	515	412	103	—	—	—	—
500	—	—	—	—	590	472	118	—	—	—	—

① For 90 and 80 percent power factor, the above figures shall be multiplied by 1.1 and 1.25 respectively.

Ampacities of Insulated Conductors (Based on 1996 NEC ①)

Table 310-16. **Allowable Ampacities of Insulated Conductors Rated 0 – 2000V, 60° – 90°C (140° – 194°F), Not More Than Three Current-Carrying Conductors in Raceway or Cable or Earth (Directly Buried), Based on Ambient Temperature of 30°C (86°F)**

Size	Temperature Rating of Conductor. See NEC Table 310-13.						Size
AWG kcmil	60°C (140°F)	75°C (167°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	90°C (194°F)	AWG kcmil
	Types TW†, UF†	Types FEPW†, RH†, RHW†, THHW†, THW†, THWN†, XHHW†, USE†, ZW†	Types TBS, SA, SIS, FEP†, FEPB†, MI, RHH†, RHW-2, THHN†, THHW†, THW-2†, THWN-2†, USE-2, XHH, XHHW†, XHHW-2, ZW-2	Types TW†, UF†	Types RH†, RHW†, THHW†, THW†, THWN†, XHHW†, USE†	Types TBS, SA, SIS, THHN†, THHW†, THW-2, THWN-2, RHH†, RHW-2, USE-2, XHH, XHHW, XHHW-2, ZW-2	
	Copper			Aluminum or Copper-Clad Aluminum			
18	—	—	14	—	—	—	—
16	—	—	18	—	—	—	—
14	20†	20†	25†	—	—	—	—
12	25†	25†	30†	20†	20†	25†	12
10	30	35†	40†	25	30†	35†	10
8	40	50	55	30	40	45	8
6	55	65	75	40	50	60	6
4	70	85	95	55	65	75	4
3	85	100	110	65	75	85	3
2	95	115	130	75	90	100	2
1	110	130	150	85	100	115	1
1/0	125	150	170	100	120	135	1/0
2/0	145	175	195	115	135	150	2/0
3/0	165	200	225	130	155	175	3/0
4/0	195	230	260	150	180	205	4/0
250	215	255	290	170	205	230	250
300	240	285	320	190	230	255	300
350	260	310	350	210	250	280	350
400	280	335	380	225	270	305	400
500	320	380	430	260	310	350	500
600	355	420	475	285	340	385	600
700	385	460	520	310	375	420	700
750	400	475	535	320	385	435	750
800	410	490	555	330	395	450	800
900	435	520	585	355	425	480	900
1000	455	545	615	375	445	500	1000
1250	495	590	665	405	485	545	1250
1500	520	625	705	435	520	585	1500
1750	545	650	735	455	545	615	1750
2000	560	665	750	470	560	630	2000

Correction Factors

Ambient Temp. °C	For Ambient Temperatures Other Than 30°C (86°F), Multiply the Allowable Ampacities Shown Above by the Appropriate Factor Shown Below						Ambient Temp. °F
21 – 25	1.08	1.05	1.04	1.08	1.05	1.04	70 – 77
26 – 30	1.00	1.00	1.00	1.00	1.00	1.00	78 – 86
31 – 35	.91	.94	.96	.91	.94	.96	87 – 95
36 – 40	.82	.88	.91	.82	.88	.91	96 – 104
41 – 45	.71	.82	.87	.71	.82	.87	105 – 113
46 – 50	.58	.75	.82	.58	.75	.82	114 – 122
51 – 55	.41	.67	.76	.41	.67	.76	123 – 131
56 – 60	—	.58	.71	—	.58	.71	132 – 140
61 – 70	—	.33	.58	—	.33	.58	141 – 158
71 – 80	—	—	.41	—	—	.41	159 – 176

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† Unless otherwise specifically permitted elsewhere in this *Code*, the overcurrent protection for conductor types marked with an obelisk (†) shall not exceed 15A for No. 14, 20A for No. 12 and 30A for No. 10 copper; or 15A for No. 12 and 25A for No. 10 aluminum and copper-clad aluminum after any correction factors for ambient temperature and number of conductors have been applied.

Notes to Tables 310-16, 310-18

1. 120/240V, 3-Wire, Single-Phase Dwelling Services and Feeders. For dwelling units, conductors, as listed below, shall be permitted to be utilized as 120/240V, 3-wire, single-phase service-entrance conductors, service lateral conductors and feeder conductors that serve as the main power feeder to a dwelling unit and are installed in raceway or cable with or without an equipment grounding conductor. For applications of this note, the feeder conductors to a dwelling unit shall not be required to be larger than its service-entrance conductors. The grounded conductor shall be permitted to be smaller than the ungrounded conductors, provided the requirements of Sections 215-2, 220-22 and 230-42 are met.

Conductor Types and Sizes RH-RHH-RHW-THHW-THW-THWN-THHN-XHHW-USE

Copper	Aluminum or Copper-Clad Aluminum	Service or Feeder Rating in Amps
AWG	AWG	
4	2	100
3	1	110
2	1/0	125
1	2/0	150
1/0	3/0	175
2/0	4/0	200
3/0	250 kcmil	225
4/0	300 kcmil	250
250 kcmil	350 kcmil	300
350 kcmil	500 kcmil	350
400 kcmil	600 kcmil	400

8. Adjustment Factors.

(a) More Than Three Current-Carrying Conductors in a Raceway or Cable. Where the number of current-carrying conductors in a raceway or cable exceeds three, the allowable ampacities shall be reduced as shown in the following table:

Number of Current-Carrying Conductors	Percent of Values in Tables as Adjusted for Ambient Temperature if Necessary
4 – 6	80
7 – 9	70
10 – 20	50
21 – 30	45
31 – 40	40
41 and above	35

Where single conductors or multiconductor cables are stacked or bundled longer than 24 in. (610 mm) without maintaining spacing and are not installed in raceways, the allowable ampacity of each conductor shall be reduced as shown in the above table.

Ampacities of Insulated Conductors (Based on 1996 NEC ①) — Continued

Table 310-18. **Allowable Ampacities of Three Single Insulated Conductors Rated 0 – 2000V, 150° – 250°C (302° – 482°F), in Raceway or Cable Based on Ambient Air Temperature of 40°C (104°F)**

Size	Temperature Rating of Conductor. See NEC Table 310-13.				Size
AWG kcmil	150°C (302°F)	200°C (392°F)	250°C (482°F)	150°C (302°F)	AWG kcmil
	Type Z	Types FEP, FEPB, PFA	Types PFAH, TFE	Type Z	
	Copper		Nickel or Nickel-Coated Copper	Aluminum or Copper-Clad Aluminum	
14	34	36	39	—	14
12	43	45	54	30	12
10	55	60	73	44	10
8	76	83	93	57	8
6	96	110	117	75	6
4	120	125	148	94	4
3	143	152	166	109	3
2	160	171	191	124	2
1	186	197	215	145	1
1/0	215	229	244	169	1/0
2/0	251	260	273	198	2/0
3/0	288	297	308	227	3/0
4/0	332	346	361	260	4/0
250	—	—	—	—	250
300	—	—	—	—	300
350	—	—	—	—	350
400	—	—	—	—	400
500	—	—	—	—	500
600	—	—	—	—	600
700	—	—	—	—	700
750	—	—	—	—	750
800	—	—	—	—	800
1000	—	—	—	—	1000
1500	—	—	—	—	1500
2000	—	—	—	—	2000

Correction Factors

Ambient Temp. °C	For Ambient Temperatures Other Than 40°C (104°F), Multiply the Allowable Ampacities Shown Above By the Appropriate Factor Shown Below				Ambient Temp. °F
41 – 50	.95	.97	.98	.95	105 – 122
51 – 60	.90	.94	.95	.90	123 – 140
61 – 70	.85	.90	.93	.85	141 – 158
71 – 80	.80	.87	.90	.80	159 – 176
81 – 90	.74	.83	.87	.74	177 – 194
91 – 100	.67	.79	.85	.67	195 – 212
101 – 120	.52	.71	.79	.52	213 – 248
121 – 140	.30	.61	.72	.30	249 – 284
141 – 160	—	.50	.65	—	285 – 320
161 – 180	—	.35	.58	—	321 – 356
181 – 200	—	—	.49	—	357 – 392
201 – 225	—	—	.35	—	393 – 437

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Notes to Tables 310-16, 310-18 — Continued

8. Adjustment Factors. (continued)

Exception No. 1

Where conductors of different systems, as provided in Section 300-3, are installed on a common raceway or cable, the derating factors shown shall apply to the number of power and lighting (Articles 210, 215, 220 and 230) conductors only.

Exception No. 2

For conductors installed in cable trays, the provisions of Section 318-11 shall apply.

Exception No. 3

Derating factors shall not apply to conductors in nipples having a length not exceeding 24 in. (610 mm).

Exception No. 4

Derating factors shall not apply to underground conductors entering or leaving an outdoor trench if those conductors have physical protection in the form of rigid metal conduit, intermediate metal conduit, or rigid nonmetallic conduit having a length not exceeding 10 ft. (3.05m) and the number of conductors does not exceed four.

Exception No. 5.

For other loading conditions, adjustment factors and ampacities shall be permitted to be calculated under Section 310-15(b).

(FPN): See Appendix B, Table B-310-11, for adjustment factors for more than three current-carrying conductors in a raceway or cable with load diversity.

(b) More Than One Conduit, Tube or Raceway. Spacing between conduits, tubing or raceways shall be maintained.

9. Overcurrent Protection. Where the standard ratings and settings of overcurrent devices do not correspond with the ratings and settings allowed for conductors, the next higher standard rating and setting shall be permitted.

Exception: As limited in Section 240-3.

10. Neutral Conductor.

(a) A neutral conductor that carries only the unbalanced current from other conductors of the same circuit need not be counted when applying the provisions of Note 8.

(b) In a 3-wire circuit consisting of two phase wires and the neutral of a 4-wire, 3-phase wye-connected system, a common conductor carries approximately the same current as the line-to-neutral load currents of the other conductors and shall be counted when applying the provisions of Note 8.

(c) On a 4-wire, 3-phase wye circuit where the major portion of the load consists of nonlinear loads, there are harmonic currents present in the neutral conductor, and the neutral shall be considered to be a current-carrying conductor.

11. Grounding or Bonding Conductor. A grounding or bonding conductor shall not be counted when applying the provisions of Note 8.

Enclosure Ratings

The UL, NEMA and IEC organizations (and other international groups) define degrees of protection provided by electrical enclosures with respect to personnel, equipment within the housing and the ingress of water.

Subtle differences do exist between the test procedures and specifications of these organizations.

To claim ratings to NEMA specifications, the testing is performed and certified by the manufacturers themselves.

To comply to UL and IEC specifications, the manufacturers must submit product samples, materials used and other data to an independent testing laboratory before ratings can be claimed.

In addition, IEC "IP" ratings differ from NEMA in that they do not apply to protection against the risk of explosion or conditions such as humidity, corrosive gases, fungi or vermin. In addition, different parts of the equipment can have different degrees of protection and still comply.

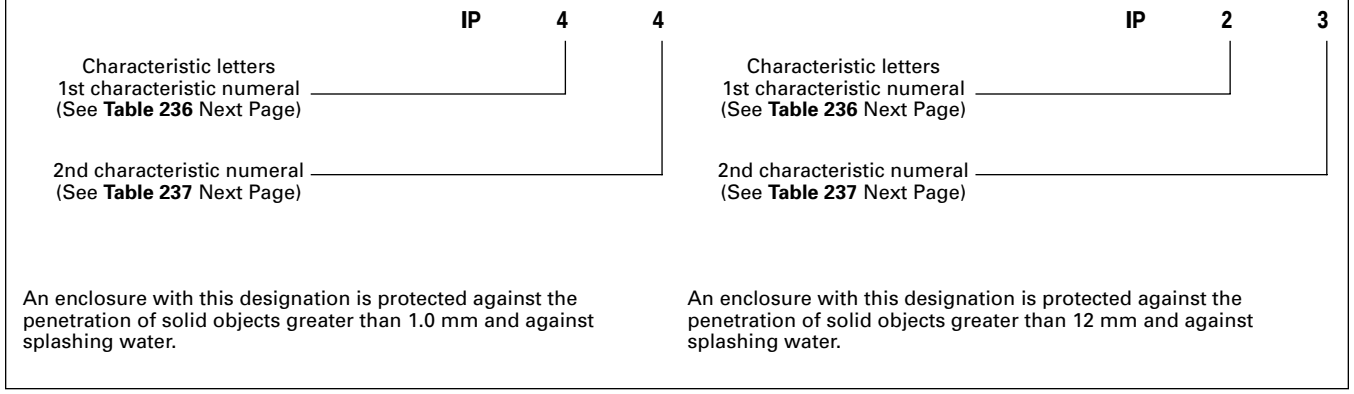
Table 234 is a comparison of the NEMA/UL/IEC enclosure specifications to be used as an approximate reference only. **Do not use the table to convert from IEC to NEMA designations.** For a definition of the ratings listed, see examples below and tables on **Page 185**.

Table 234. NEMA/UL/IEC Enclosure Type Cross-Reference — Approximate

NEMA Enclosure Rating	IP10	IP20	IP21	IP22	IP23	IP30	IP31	IP32	IP33	IP40	IP41	IP42	IP43	IP50	IP51	IP52	IP53	IP54	IP55	IP56	IP60	IP61	IP62	IP63	IP64	IP65	IP66	IP67	IP68
1	X	X	X	X	X																								
2	X	X	X	X	X																								
3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
3R	X	X	X	X	X	X	X	X																					
3S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
4X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6P	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			

Note: IEC 529 does not specify equivalents to NEMA Enclosure Types 7, 8, 9 or 10.

Table 235. IEC Environmental Enclosure Ratings — Examples of Designations



An enclosure with this designation is protected against the penetration of solid objects greater than 1.0 mm and against splashing water.

An enclosure with this designation is protected against the penetration of solid objects greater than 12 mm and against splashing water.

Index of Enclosure Ratings — IEC

Table 236. 1st Characteristic Numeral

Protected against contact and penetration of solid bodies.	
0	Not protected.
1	Protection against solid objects greater than 50 mm.
2	Protection against solid objects greater than 12 mm.
3	Protection against solid objects greater than 2.5 mm.
4	Protection against solid objects greater than 1.0 mm.
5	Dust protected.
6	Dust-tight.

Table 237. 2nd Characteristic Numeral

0	Not protected.
1	Protection against dripping water.
2	Protection against dripping water when tilted up to 15 degrees.
3	Protection against rain.
4	Protection against splashing water.
5	Protection against water jets.
6	Protection against heavy seas.
7	Protection against the effects of immersion.
8	Protection against submersion.

NEMA Definitions Pertaining to Non-hazardous Locations — NEMA Standard 250

Type 1

Enclosures are intended for indoor use, primarily to provide a degree of protection against contact with the enclosed equipment.

Type 3

Enclosures are intended for outdoor use, primarily to provide a degree of protection against windblown dust, rain, sleet and external ice formation.

Type 3R

Enclosures are intended for outdoor use, primarily to provide a degree of protection against falling rain, sleet and external ice formation.

Type 4

Enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against windblown dust and rain, splashing water and hose-directed water.

Type 4X

Enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water and hose-directed water.

Type 6

Enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against the entry of water during occasional temporary submersion at a limited depth.

Type 6P

Enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against the entry of water during prolonged submersion at a limited depth.

Type 12

Enclosures are intended for indoor use, primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids.

Type 13

Enclosures are intended for indoor use, primarily to provide a degree of protection against dust, spraying of water, oil and non-corrosive coolant.

NEC Definitions Pertaining to Hazardous Locations — Article 500

E51 Limit Switch Type Proximity Switches are rated for use in the following locations:

Class I Division 2, Groups A, B, C or D — Indoor Use

- For the definition of a Class I Division 2 location, see National Electrical Code Article 500-5, paragraph (b).
- For the definitions of Class I Group A, B, C, D Classifications, see the National Electrical Code Article 500-3, paragraph (a).

Class II Division 2, Groups F or G — Indoor Use

- For the definition of a Class II Division 2 location, see National Electrical Code Article 500-6, paragraph (b).
- For the definitions of Class II Group F and G Classifications, see the National Electrical Code Article 500-3, paragraph (b).

Class III Division 2 — Indoor Use

- For the definition of a Class III Division 2 location, see National Electrical Code Article 500-7, paragraph (b).
- For the definitions of Class III Classifications, see the National Electrical Code Article 500-7.